DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R1–ES–2010–0043; MO 92210–0–0009]

RIN 1018–AV49

Endangered and Threatened Wildlife and Plants; Listing 23 Species on Oahu as Endangered and Designating Critical Habitat for 124 Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list 23 species on the island of Oahu in the Hawaiian Islands as endangered under the Endangered Species Act of 1973, as amended (Act). We also propose to designate critical habitat for these 23 species, to designate critical habitat for 2 plant species that are already listed as endangered, and revise critical habitat for 99 plant species that are already listed as endangered or threatened. The proposed critical habitat designation totals 43,491 acres (ac) (17,603 hectares (ha)), and includes occupied and unoccupied habitat. Approximately 93percent of the area being proposed as critical habitat is already designated as critical habitat for the 99 plant species or other species. In this proposed rule we are also proposing a taxonomic revision of the scientific names of nine plant species.

DATES: We will consider comments received on or postmarked on or before October 3, 2011. Please note that if you are using the Federal eRulemaking Portal (see **ADDRESSES** section below), the deadline for submitting an electronic comment is 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 September 16, 2011.

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

- Federal eRulemaking Portal: *http://www.regulations.gov.* In the box that reads ''Enter Keyword or ID,'' enter the docket number for this proposed rule, which is FWS–R1–ES–2010–0043. Check the box that reads ''Open for Comments/Submission,'' and click the Search Button. You should then see an icon that reads ''Submit a Comment.'' Please ensure that you have found the correct rulemaking before submitting your comment.
- U.S. mail or hand-delivery: Public Comments Processing, Attn: FWS–R1–ES–2010–0043; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042; 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:

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 other concerned governmental agencies, the scientific community, industry, or other interested parties concerning this proposed rule. We particularly seek comments concerning:

(1) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to the 23 species proposed for listing, and regulations that may be addressing those threats.

(2) Additional information concerning the range, distribution, and population size of each of the 23 species proposed for listing, including the locations of any additional populations of these species.

(3) Any information on the biological or ecological requirements of the 23 species proposed for listing.

(4) Current or planned activities in the areas occupied by both the 23 species proposed for listing and the additional 101 plant species proposed for critical habitat designation or revision, and possible impacts of these activities on this species.

(5) The reasons why we should or should not designate habitat for all 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 of 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.

(6) Whether a revision of critical habitat is warranted for the 99 plant species already listed as endangered or threatened under the Act.

(7) 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.

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

(9) 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 exhibit these impacts.

(10) 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), we may exclude an area from critical habitat if we determine 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.

(11) Whether our exemptions under section 4(a)(3)(B)(i) of the Act of the lands on Department of Defense (DOD) land at Dillingham Military Reservation,

Kahuku Training Area, Kawailoa Training Area, Makua Military Reservation, Schofield Barracks East Range, and Schofield Barracks Military Reservation, are or are not appropriate and why.

(12) Information on the projected and reasonably likely impact of climate change on the species included in this proposed rule, and 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 the taxonomic classification for the nine plant 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 addition to the required items specified in the previous paragraph, such as your street address, phone number, or e-mail 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

It is our intent to discuss below only those topics directly relevant to the listing of and designation of critical habitat for the species in this proposed rule.

Previous Federal Action

Nineteen of the 23 species proposed 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 plants *Bidens amplectens, Cyanea calycina, C. lanceolata, Cyrtandra kaulantha, C. sessilis, Doryopteris takeuchii, Korthalsella degeneri, Melicope christophersenii, M. hiiakae, M. makahae, Platydesma cornuta* var. *cornuta, P. cornuta var. decurrens, Pleomele forbesii, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa,* and *Zanthoxylum oahuense;* and the blackline Hawaiian damselfly (*Megalagrion nigrohamatum nigrolineatum*), the crimson Hawaiian damselfly (*M. leptodemas*), and the oceanic Hawaiian damselfly (*M. oceanicum*). The candidate status of all of these species was most recently assessed and reaffirmed in the November 10, 2010, Notice of Review of Native Species that are Candidates for Listing as Threatened or Endangered (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 19 candidate species listed above, as endangered or threatened under the provisions of the Act. Since then, we have published our annual findings on the May 4, 2004, petition (including our findings on the 19 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 57803), and November 10, 2010 (75 FR 69222).

In addition to the 19 candidate species, we are proposing to list four species of plants endemic to Oahu, which include *Cyanea purpurellifolia, Cyrtandra gracilis, C. waiolani,* and *Tetraplasandra lydgatei.* These four Oahu plant species, as well as approximately 180 others on the Hawaiian Islands, have been identified as the ''rarest of the rare'' Hawaiian plant species in need of immediate conservation, under the multi-agency (Federal, State, and private) Plant Extinction Prevention (PEP) Program. The goal of this program 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, Maui, Molokai, Lanai, and Hawaii (Hawaii Division of Forestry and Wildlife (DOFAW) 2007; Service 2007). We believe these four endemic Oahu plant species warrant listing under the Act for the reasons discussed in the Summary of Factors Affecting the 23 Species Proposed for Listing section (below). Because these 4 plant species occur within 3 of the 7 ecosystems identified in this proposed rule, and share common threats with the other 19 species proposed 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.

On June 17, 2003, we published a final rule designating approximately 55,040 ac (22,274 ha) as critical habitat for 99 plant species on Oahu (68 FR 35950; June 17, 2003). If made final, this rule would supersede that designation. In addition, we are proposing critical habitat for two endangered plant species for which critical habitat has not been previously proposed or designated. When we listed the plant *Chamaesyce skottsbergii* var. *skottsbergii* in 1982 (47 FR 36846), we found that the designation of critical habitat was not determinable, since we were unable to identify the biological needs of this species (see *Proposed Taxonomic Name Changes* below for additional information). When we listed the plant *Achyranthes splendens* var. *rotundata* as endangered in 1986 (58 FR 10518), we found that designation of critical habitat was not prudent because this plant was threatened by taking for lei-making, and the publication of plant locations could make this plant more vulnerable to collection by individuals. We have reviewed the best available information on both species, and have determined the designation of critical habitat is now prudent (see *Prudency Determination* below for additional information).

An Ecosystem-Based Approach to Listing 23 Species on Oahu

On the island of Oahu, 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 on the successful functioning of that ecosystem to survive. We have therefore organized the species addressed in this proposed rule by common ecosystems. Although the listing determination for each species is analyzed separately, we have

organized the specific 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 requires similar management actions. 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 not only to organize this proposed rule efficiently, but also to more effectively focus conservation management efforts on the common threats that occur across these ecosystems, restore 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.

We propose to list *Bidens amplectens, Cyanea calycina, Cyanea lanceolata, Cyanea purpurellifolia, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra sessilis, Cyrtandra waiolani, Doryopteris takeuchii, Korthalsella degeneri, Melicope christophersenii, Melicope hiiakae, Melicope makahae, Platydesma cornuta* var. *cornuta, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Tetraplasandra lydgatei,* and *Zanthoxylum oahuense;* and the blackline, crimson, and oceanic Hawaiian damselflies, endemic to the island of Oahu, as endangered species. These 23 species (20 plants and 3 damselflies) are found in 7 ecosystem types: coastal, lowland dry, lowland mesic, lowland wet, montane wet, dry cliff, and wet cliff (Table 1).

TABLE 1—THE 23 SPECIES AND THE ECOSYSTEMS UPON WHICH THEY DEPEND

Ecosystem	Species
Coastal	Plants: *Bidens amplectens.*
Lowland Dry	Plants: *Bidens amplectens, Doryopteris takeuchii, Pleomele forbesii.*
Lowland Mesic	Plants: *Cyanea calycina, Cyanea lanceolata, Cyrtandra waiolani, Melicope makahae, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Tetraplasandra lydgatei.* Animals: oceanic Hawaiian damselfly.
Lowland Wet	Plants: *Cyanea calycina, Cyanea lanceolata, Cyanea purpurellifolia, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra sessilis, Cyrtandra waiolani, Melicope hiiakae, Melicope makahae, Platydesma cornuta* var. *cornuta, Pleomele forbesii, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Zanthoxylum oahuense.* Animals: crimson Hawaiian damselfly, blackline Hawaiian damselfly, oceanic Hawaiian damselfly.
Montane Wet	Plants: *Cyanea calycina, Melicope christophersenii.*
Dry Cliff	Plants: *Korthalsella degeneri, Melicope makahae, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa.*
Wet Cliff	Plants: *Cyanea calycina, Cyanea purpurellifolia, Cyrtandra kaulantha, Cyrtandra sessilis, Melicope christophersenii, Psychotria hexandra ssp. oahuensis, Pterlyxia macrocarpa.* Animals: crimson Hawaiian damselfly, oceanic Hawaiian damselfly.

Most of these species are found in multiple ecosystems. 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 plants is considered a threat to each species within each ecosystem. As a result, this threat factor is considered to be a multiple ecosystem threat, as each individual species within each ecosystem faces a threat that is essentially identical in terms of the nature of the impact, its severity, its imminence, and its scope. We further identified and evaluated any threat factors that may be unique to certain species, that is, threat factors that do not apply to all species under consideration within the same ecosystem. For example, the threat of predation by nonnative fish is unique to the three damselflies in this proposed rule; it 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 Physical or Biological Features of Critical Habitat

Under 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 the 23 Oahu species for which we are also proposing endangered status. We are also proposing to designate critical habitat for two Oahu plants that are already listed as endangered species but for which critical habitat has not been designated. In addition, we are proposing to revise critical habitat for 99 Oahu plants already listed as endangered or threatened species. When critical habitat was designated for these 99 Oahu plant species in 2003 (68 FR 35950; June 17, 2003), it was based primarily on the specific localities where the species were known to occur. We are proposing to revise critical habitat for these species because since then, we have learned that many native Hawaiian plants and animals currently occupy only areas of marginal habitat because the threats are reduced in these areas, and can thrive when reintroduced into historical habitats when threats are effectively managed. For this reason, we believe it is important to designate unoccupied habitat where it is essential for the recovery of the species. Based on new information on plant occurrences and a better understanding of the species' biological requirements, the physical or biological features have been more precisely identified, and now include elevation, precipitation, substrate, canopy, subcanopy, and understory characteristics. We believe the added precision will be helpful in identifying the special management considerations or protections needed in specific occupied areas to recover the species. In addition, because the 2003 designation focused on discrete areas occupied by the species at the time of listing, the result was an overlapping and confusing patchwork of critical habitat areas for the 99 plant species that was difficult for the public to interpret. Although this proposed revision of critical habitat is solely based on occupied areas with physical or biological features essential to the

species' conservation, and unoccupied areas that are essential to the species' conservation, we believe the end result will provide for greater public understanding of the conservation and recovery needs of each of the species in the specific areas addressed in this proposed rule.

In this proposed rule, we propose critical habitat for 124 species in 66 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 contains areas essential to the conservation of those species that do not presently occupy that particular unit but depend on that ecosystem type for recovery purposes. Where the unit is not occupied by a particular species, we believe it is still essential for the conservation of that species. The designation of unoccupied habitat 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 a stochastic event at one or more locations where the species occurs.

Each of the areas proposed for designation represents critical habitat for multiple species, based upon their shared habitat requirements, and takes into account any species-specific conservation needs as appropriate. For example, the presence of a perennial stream is essential for the conservation of the blackline Hawaiian damselfly, but is not a requirement shared by all species within the same ecosystem; however, a functioning ecosystem is also essential to the damselfly because the ecosystem provides other physical or biological features that support the damselfly's specific life-history requirements.

The Island of Oahu

The island of Oahu is the third oldest and third largest of the eight main Hawaiian Islands, located southeast of Kauai and northwest of Molokai and Lanai (Foote *et al.* 1972, p. 19; Department of Geography, University of Hawaii at Hilo (UHH) 1998, p. 7). It was formed from two shield volcanoes that ceased erupting about 1 to 2 million years ago, and is about 600 square (sq) miles (mi) (1,557 sq kilometers (km)) in area (Macdonald and Abbot 1970, p. 265; Foote *et al.* 1972, p. 19; Department of Geography, UHH 1998, p. 7). Two mountain ranges resulted from these eruptions, the western Waianae range and eastern Koolau range. Oahu is characterized by the fact that the two mountain ranges are aligned perpendicular to the prevailing trade winds, so that distinctive leeward and windward climates result, with the Waianae range in the rain shadow of the Koolau range (Department of Geography, UHH 1998, p. 7; Wagner *et al.* 1999, p. 39). The maximum elevation on Oahu is 4,025 feet (ft) (1,225 meters (m)) at the summit of Mount Kaala in the Waianae Mountains, and this higher elevation area is not affected by the rain shadow (Blumenstock and Price 1972, p. 156; Wagner *et al.* 1999, pp. 39–41). The maximum elevation is relatively low compared to the higher Hawaiian Islands. Consequently, Oahu does not have dry alpine areas, as the mountains do not reach the height of the temperature inversion layer (Wagner *et al.* 1999, pp. 38, 40). Rainfall ranges from less than 20 inches (in) (500 millimeters (mm)) to more than 250 in (6,350 mm) per year (Department of Geography, UHH 1998, p. 7). Temperatures in the Hawaiian Islands differ by an average of 41 degrees Fahrenheit (°F) (22 degrees Celsius (°C)) throughout the year. Since temperature decreases with increasing elevation, microclimates range from tropical to sub-arctic across the island chain (Wagner *et al.* 1999, pp. 37–38), although the sub-arctic zone does not occur on Oahu.

The current soil classification system for the Hawaiian Islands distinguishes soil types based on their measurable physical and chemical properties and environmental factors that influenced their formation. Widely ranging geological ages of rocks, different rates of weathering, and microclimates create these highly variable soils (Sherman 1972, pp. 205–207). Most soils are volcanic in origin; a few formed from organic material and sand (Foote *et al.* 1972, p. 1). On Oahu, sizable areas of highly weathered, red-colored oxisols (nutrient poor soils, red or yellowish) occur on the Schofield Plateau; in contrast, the Koolau and Waianae mountain ranges have large areas of rocky, unweathered entisols (soils with few or no horizontal layers) due to erosion (Gavenda *et al.* 1998, p. 92).

Because of its age and relative isolation, species diversity and endemism are high in the Hawaiian archipelago (Gagne and Cuddihy 1999, p. 45). However, the flora and fauna of Oahu have 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 (Gagne and Cuddihy 1999, p. 45) or pasture. Intentional and inadvertent introduction of alien plant and animal species has contributed to the reduction in range of native species on the island (throughout this proposal, the terms ''alien,'' ''feral,'' ''nonnative,'' and ''introduced'' all refer to species that are not naturally native to the Hawaiian Islands.) Most of the taxa included in this proposed rule persist on 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.

Oahu Ecosystems

The seven Oahu ecosystems that support the species addressed in this proposed rule are described in the following sections.

Coastal

The coastal ecosystem is found on all of the main Hawaiian Islands, with the highest species diversity found in the least populated coastal areas of Hawaii, Maui, Molokai, Kahoolawe, Oahu, and Kauai, and their associated islets. On Oahu, the coastal ecosystem includes mixed herblands, shrublands, and grasslands, from sea level to approximately 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 farther inland if strong prevailing onshore winds drive sea spray and sand dunes into the lowland zone (The Nature Conservancy (TNC) 2006a). The coastal vegetation zone 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 rare native plant *Sesbania tomentosa* (ohai) (TNC 2006a). The plant *Bidens amplectens,* which is proposed for listing as endangered in this proposed rule, is reported from this ecosystem on Oahu (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 centimeters (cm)) annual rainfall, or are in otherwise prevailingly dry substrate conditions. Areas consisting of predominantly native species in the lowland dry ecosystem are now rare; however, this ecosystem is found on the islands of Hawaii, Molokai, Lanai, Kahoolawe, Oahu, and Kauai, and is best represented on the leeward sides of the islands (Gagne and Cuddihy 1999, p. 67). On Oahu, this ecosystem is typically found on the leeward side of the Waianae Mountains, and the leeward southern coast, including Diamond Head Crater (Gagne and Cuddihy 1999, p. 67; TNC 2006b). 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) (Wagner *et al.* 1999, pp. 1,220–1,221; TNC 2006b). The plants *Bidens amplectens, Doryopteris takeuchii,* and *Pleomele forbesii,* which are proposed for listing as endangered in this proposed rule, are reported in this ecosystem on Oahu (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, or are in otherwise mesic substrate conditions (TNC 2006c). In the Hawaiian Islands, this ecosystem is found on Hawaii, Maui, Molokai, Lanai, and Kauai, on both windward and leeward sides of the islands. On Oahu, this ecosystem is typically found on the leeward slopes of both the Waianae and Koolau Mountains (Gagne and Cuddihy 1999, p. 75; TNC 2006c). Biological diversity is high in this system (TNC 2006c). The plants *Cyanea calycina, C. lanceolata, Cyrtandra waiolani, Melicope makahae, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa,* and *Tetraplasandra lydgatei,* and the oceanic Hawaiian damselfly, which are proposed for listing as endangered in this proposed rule, are reported in this ecosystem (HBMP 2008; TNC 2007).

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 Kahoolawe and Niihau (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 Oahu, this system is best developed in wet valleys and slopes along the summit of the Koolau Mountains, with a small area located on the windward side of the summit of the Waianae Mountains (TNC 2006d). Biological diversity is high in this system (TNC 2006d). The plants *Cyanea calycina, C. lanceolata, C. purpurellifolia, Cyrtandra gracilis, C. kaulantha, C. sessilis, C. waiolani, Melicope hiiakae, M. makahae, Platydesma cornuta* var. *cornuta, Pleomele forbesii, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa,* and *Zanthoxylum oahuense;* and the blackline, crimson, and oceanic Hawaiian damselflies, which are proposed for listing as endangered in this proposed rule, are reported in this ecosystem (HBMP 2008; TNC 2007).

Montane Wet

The montane wet ecosystem is composed of natural communities (grasslands, shrublands, forests, and bogs) found at elevations generally between 3,300 and 6,600 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 (only the islands of Molokai, Maui, and Hawaii have areas above 4,020 ft (1,225 m)) (TNC 2006e). On Oahu, this ecosystem is found only at the summit of the Waianae Mountains (TNC 2007). Biological diversity is moderate to high (TNC 2006e). Due to the restricted distribution of this ecosystem on Oahu, only the plants *Cyanea calycina* and *Melicope christophersenii,* which are proposed for listing as endangered in this proposed rule, are reported in this ecosystem (HBMP 2008; TNC 2007).

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 2006f). This ecosystem is found on all of the main Hawaiian Islands except Niihau, and on the island of Oahu is best represented along the leeward slopes of the Waianae Mountains (TNC 2006f). A variety of shrublands occur within this ecosystem (TNC 2006f). Biological diversity is low to moderate (TNC 2006f). The plants *Korthalsella degeneri, Melicope makahae, Platydesma cornuta* var. *decurrens, Pleomele forbesii,* and *Pteralyxia macrocarpa,* which are proposed for listing as endangered in this proposed rule, are reported in this ecosystem (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 2006g). This system is found on the islands of Hawaii, Maui, Molokai, Lanai, Oahu, and Kauai. On Oahu, this ecosystem is typically found along the entire length of the summit of the Koolau Mountains and at the summit of Mt. Kaala in the Waianae Mountains (TNC 2006g). Biological diversity is low to moderate (TNC 2006g). The plants *Cyanea calycina, C. purpurellifolia, Cyrtandra kaulantha, C. sessilis, Melicope christophersenii, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa;* and the crimson and oceanic Hawaiian damselflies, which are proposed for listing as endangered in this proposed rule, are reported in this ecosystem (HBMP 2008; TNC 2007).

Species Description of the 23 Species Proposed for Listing

Below is a brief description of each of the 23 species proposed for listing, presented in alphabetical order by genus. Plants are presented first, followed by animals.

Plants

Bidens amplectens (kookoolau), a perennial or sometimes annual herb in the sunflower family (Asteraceae), is restricted to windward cliffs and crests along the northern portion of the Waianae Mountains on the island of Oahu, in the coastal and lowland dry ecosystems, at elevations between 300 and 1,400 ft (90 and 430 m) (Ganders and Nagata 1999, p. 271; TNC 2007; HBMP 2008). This species intergrades with *B. torta* and forms hybrid swarms from near Kaena Point along the Waianae summit ridges to the head of Makua Valley (a hybrid swarm occurs where there is no reproductive barrier between distinct populations, or where a barrier has broken down). Pure *B. amplectens* is restricted to the windward cliffs and crests of the Waianae range (Ganders and Nagata 1999, p. 271). *Bidens amplectens* was historically known from five locations spanning 7 mi (11 km) in the northern Waianae Mountains including Makaleha Valley, Uluhulu Gulch, Puu Pueo to Alau Gulch, Manini Gulch to Alau Gulch, and Nihoa Gulch (HBMP 2008).

At last observation, it totaled fewer than 1,000 individuals in four locations separated by less than 4 mi (6 km): Kealia Trail on the east side of Haili Gulch; Kapuna-Kamimi Ridge on the road to the Pahole Natural Area Reserve (NAR); Kealia east of Kawaiu Gulch; and from Kuaokala to Keawaula Ridge (J. Lau, in litt. 2001; HBMP 2008).

Cyanea calycina (haha), an unbranched shrub in the bellflower family (Campanulaceae), is found in both the Waianae and Koolau Mountains of Oahu in the lowland mesic, lowland wet, montane wet, and wet cliff ecosystems (Lammers 1999, p. 483; Wagner and Herbst 2003, p. 17; TNC 2007; HBMP 2008). In the Waianae Mountains, *C. calycina* occurs in *Acacia-Metrosideros-Dicranopteris* (koa-ohia-uluhe) forests at elevations between 1,800 and 3,920 ft (550 and 1,195 m), and in the Koolau Mountains this species occurs in wet *Metrosideros-Dicranopteris* forest and shrubland at elevations generally between 1,830 and 3,000 ft (558 and 900 m) (HBMP 2008). Historically, in the Waianae Mountains, plants were found from Palikea Gulch to Pualii Gulch (HBMP 2008). Currently, *C. calycina* is found from Pahole in the northern portion of the Waianae Mountains south along the summit to Palawai in 18 occurrences totaling at least 170 individuals (U.S. Army 2006; HBMP 2008). In the Koolau Mountains, *C. calycina* was known historically along the entire length of the range (HBMP 2008). Currently, 22 occurrences totaling between 155 and 169 individuals are known, from the most northern point at Kamananui Gulch along the summit ridges south to Konahuanui (U.S. Army 2006; HBMP 2008). The combined 40 occurrences total 325 to 339 individuals.

Cyanea lanceolata (haha) is an unbranched shrub in the bellflower family (Campanulaceae) that occurs in the southeastern Koolau Mountains in the lowland mesic and lowland wet ecosystems, at elevations generally between 1,000 and 2,500 ft (300 and 760 m) (Wagner *et al.* 1999, p. 483; Wagner and Herbst 2003, p. 17; TNC 2007; HBMP 2008). Historically, this species was wide-ranging along the Koolau Mountains, from the northern Schofield-Waikane area to Wailupe at the southern end of the range, in at least 17 occurrences (HBMP 2008). Currently, there are 7 known occurrences, totaling fewer than 123 individuals, sparsely scattered over a much smaller area of the southern and northern Koolau range. The southern occurrences include Kului-Hawaii Loa, Wailupe, Mauumae, and Waialae Nui, with an unconfirmed report of individuals in Pia Valley (HBMP 2008; J. Lau, in litt. 2008). The northern occurrences include individuals north of Kawaiiki Stream, at Poamoho, and at Peahinaia (U.S. Army 2006).

Cyanea purpurellifolia (haha) is an unbranched shrub in the bellflower family (Campanulaceae) that occurs in the Koolau Mountains in the lowland wet and wet cliff ecosystems, at elevations generally between 1,860 and 2,160 ft (570 and 660 m) (TNC 2007; HBMP 2008). Historically, this species was known from a few individuals in the vicinity of Kaluanui Valley and north to Maakua-Papali Ridge (Lammers 1999, p. 484; Wagner and Herbst 2003, p. 17; HBMP 2008). Currently, *C. purpurellifolia* occurs in the northern Koolau Mountains from Maakua-Kaipapau to Punaluu-Kaluanui Ridge, in 5 occurrences totaling approximately 18 individuals (Plant Extinction Prevention (PEP) Program 2008, pp. 20–21; HBMP 2008).

Cyrtandra gracilis (haiwale) (Gesneriaceae, African violet family) is a perennial shrub that is found in *Metrosideros-Dicranopteris* forest in the lowland wet ecosystem at approximately 1,600 ft (490 m) in elevation, on the leeward side of the southern Koolau Mountains (Wagner *et al.* 1999, p. 755; National Tropical Botanical Garden (NTBG) Provenance Report 2004; TNC 2007; HBMP 2008; PEP Program 2008, p. 16). Presumed extinct since the 1800s, 10 individuals of *C. gracilis* were discovered by botanists in Pia Valley in 2001 (NTBG Provenance Report 2002). Between 2001 and 2008, only six to eight plants were observed at this location (NTBG Provenance Report 2002; PEP Program 2008, p. 16; A. Bakutis, in litt. 2008). It is apparently extirpated from historical locations in Palolo Valley, Konahuanui Gulch, and Manoa Valley (Wagner *et al.* 1999, p. 755; HBMP 2008).

Cyrtandra kaulantha (haiwale) is a perennial shrub in the African violet family (Gesneriaceae) found in dense shade in moist wooded gulches at elevations generally between 840 and 1,050 ft (255 and 320 m), in the lowland wet and wet cliff ecosystems in the Koolau Mountains (Wagner *et al.* 1999, p. 763; TNC 2007; HBMP 2008). *Cyrtandra kaulantha* was historically known from the Waiahole Ditch trail and Kahanaiki Stream. It was considered ''locally common,'' and a collection was taken from a ''large colony'' in 1985 (W. Takeuchi, in litt. 1985; Wagner *et al.* 1999, p. 763; J. Lau, in litt. 2006). Prior to October 2005, there were 34 wild individuals in 3 occurrences (15, 8, and 11 individuals, respectively) in the subgulches of Waianu Valley (A. Bakutis, in litt. 2005). In 2005, the third occurrence was discovered crushed by a tree, leaving six living individuals (A. Bakutis, in litt. 2005). In March 2006, it was reported that only one individual remained at the second occurrence, and that some individuals in the other two occurrences had fruit (A. Bakutis, in litt. 2006a). In addition, 4 more individuals were discovered at the site of the first occurrence, bringing the total number of wild individuals to 26 (Bakutis 2006a). In May 2006, another tree fall crushed 4 individuals in the third occurrence, leaving 2 remaining; however, a fourth occurrence of 4 individuals was discovered in another subgulch, and 1 new individual was found in the first occurrence, bringing the total number of wild individuals to 27 (A. Bakutis, in litt. 2006a; Bakutis 2006b). All occurrences were visited again in April 2007, with a total of 28 wild individuals observed (PEP Program 2007, p. 17). Outplanting has been conducted in the four subgulches of Waianu Valley, but in areas some distance from the known occurrences. A total of 28 individuals were outplanted between 2005 and 2007. However, due to predation by nonnative slugs, only 12 outplanted individuals remained in 2007 (PEP Program 2007, p. 17). *Cyrtandra kaulantha* is therefore currently found in 5 occurrences totaling 28 wild and 12 outplanted individuals.

Cyrtandra sessilis (haiwale) (Gesneriaceae, African violet family) is a small shrub that was historically known only from a few collections in wet gulch bottoms and slopes of mesic valleys in the windward Koolau Mountains (Wagner *et al.* 1999, p. 778). Typical habitat is *Metrosideros* forests at elevations generally between 1,600 and 2,200 ft (490 and 670 m) in the lowland wet and wet cliff ecosystems (TNC 2007; HBMP 2008; A. Bakutis, in litt. 2008). In 1993, there were about 200 individuals in the only known occurrence near the summit of the Schofield-Waikane Trail (HBMP 2008). In 2003, there were an estimated 50 individuals in 2 occurrences (S. Perlman, in litt. 2003). *Cyrtandra sessilis* is currently known from 2 occurrences, one consisting of 75 individuals along the Waikane-Schofield Trail in Kahana Valley and the second consisting of 5 individuals at Hawaii Loa Ridge near Pia Valley (S. Perlman, in litt. 2003; A. Bakutis, in litt. 2006c; HBMP 2008; A. Bakutis, in litt. 2008).

Cyrtandra waiolani (haiwale), a small shrub in the African violet family (Gesneriaceae), is found in rich, partly sunny gulches; shady, moist banks above creeks; and wet gulch bottoms in

mesic valleys in the lowland mesic and lowland wet ecosystems (Wagner *et al.* 1999, p. 781; HBMP 2008). *Cyrtandra waiolani* was historically known from at least seven locations: five in the southern Koolau Mountains and two in the northern Koolau Mountains, at elevations generally between 800 and 3,000 ft (240 and 900 m) (HBMP 2008). Plants have not been since observed in these areas (HBMP 2008). Individuals likely representing *C. waiolani,* based on vegetative characteristics, were seen in 1994 along the ridge between Kaipapau and Maakua, and in 2005 in Kahana, but these plants are no longer alive (J. Lau, in litt. 2009). In 2005, individuals thought to be *C. waiolani* were found on the Kualono Ridge near Kaaawa; however, these plants were not flowering or fruiting at that time. Cuttings were taken for propagation and positive identification when flowering and fruiting occur (Hawaii Department of Land and Natural Resources (HDLNR) 2005; U.S. Army 2006; A. Bakutis, in litt. 2008; S. Ching, PEP, in litt. 2009; J. Lau, in litt. 2009). Many areas within the lowland mesic ecosystem in Kaaawa in the Koolau Mountains have not been surveyed for this species, including three of the historically known locations from Anahulu to Lanihuli. The Koolau mountain range is over 35 mi (58 km) in length. Historic surveys that we have records of from the 1800s did not cover the entire mountain range, but collections were made at seven widely distributed locations along the 35-mi (58-km) range. In the 1800s, forests in the Koolau Mountains were more intact at the summits; therefore, we believe that if seven collections were made, there were many more individuals in the wild. The plants were only known from a ridge between Kaipapau and Maakua in 1994, and from Kahana in 2005, but those plants are no longer present, which represents a population decline from seven (and more than seven historically) to zero. Botanists suggest that the species is likely still extant in these areas and may be found with more intensive surveying (Bakutis 2008a; J. Lau, in litt. 2009).

Doryopteris takeuchii (no common name (NCN)) is a fern in the Pteridaceae family (Palmer 2003, p. 133). It occurs in dry shrubland on the slopes of Diamond Head Crater, a volcanic tuff cone on the southern coast of Oahu, at elevations generally between 140 and 300 ft (43 and 91 m) (NTBG 2007, p.1). This area consists of pockets of native and nonnative species in the lowland dry ecosystem (TNC 2007). Little is known of the historical distribution of *D. takeuchii.* Currently, there are 101 to 124 clumps on the Kuilei cliffs and the southwest-facing gulches above Munro Trail on the outer slopes of the crater (NTBG 2007, p. 1).

Korthalsella degeneri (hulumoa), a subshrub (a perennial with stems that are woody at the base) in the mistletoe family (Viscaceae), is parasitic on the native trees *Sapindus oahuensis* (kaulu) and *Nestegis sandwicensis* (olopua) (Wagner *et al.* 1999, p. 1,339). This species occurs in diverse forest in the dry cliff ecosystem at elevations generally between 1,100 and 1,500 ft (335 and 457 m) in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008). In 1938, *K. degeneri* was recorded from Makua Valley but little else is known of its historical range (HBMP 2008). Currently, this species is known only from one widespread occurrence in Makua Valley, estimated to be between 900 and 1,000 individuals (J. Lau, in litt. 2000), and one occurrence of an unknown number of individuals in Makaha on the north-facing slopes of the southern side of the valley (U.S. Army 2006).

Melicope christophersenii (alani), a shrub or tree in the rue family (Rutaceae), occurs in wet forest and shrubland in the montane wet and wet cliff ecosystems at elevations generally between 2,400 and 4,010 ft (732 and 1,222 m) in the Waianae Mountains (Stone *et al.* 1999, pp. 1,184–1,185; U.S. Army 2006; TNC 2007; HBMP 2008). Historically, *M. christophersenii* was known from the Mt. Kaala area of the Waianae Mountains, and as far south as Puu Kaua (HBMP 2008). Currently, there are 3 occurrences totaling approximately 250 individuals in the Waianae summit area, with the southernmost occurrence at Puu Hapapa (U.S. Army 2006; HBMP 2008).

Melicope hiiakae (alani) is a small tree in the rue family (Rutaceae) that occurs in wet forest in the lowland wet ecosystem in the Koolau Mountains, generally between elevations of 1,300 and 2,260 ft (396 and 689 m) (U.S. Army 2006; NTBG 2007, p. 3; TNC 2007; HBMP 2008). Historically, *M. hiiakae* was found along the entire length of the Koolau range (HBMP 2008). Currently there are 8 scattered occurrences totaling fewer than 40 individuals from Kawailoa to Waimalu (NTBG 2007, p. 3; HBMP 2008).

Melicope makahae (alani), a shrubby tree in the rue family (Rutaceae), occurs in mesic and wet forest and shrubland in the lowland mesic, lowland wet, and dry cliff ecosystems in the Waianae Mountains, at elevations generally between 2,200 and 2,900 ft (670 and 884 m) (Stone *et al.* 1999, p. 1,194; U.S. Army 2006; TNC 2007; HBMP 2008). Historically, *M. makahae* was found in the central summit area of the Waianae Mountains on the west side of Mt. Kaala in Makaha Valley (Stone 1963, p. 410; TNC 2007). Currently, there are 4 occurrences totaling fewer than 200 individuals north and west of the summit area of the Waianae Mountains (HBMP 2008).

Platydesma cornuta var. *cornuta* (NCN) is a palmoid (leaves dividing or radiating from one point) shrub in the rue family (Rutaceae) (Stone *et al.* 1999, pp. 1,209–1,210). It occurs in wet forest, shrubland, and gulches in the lowland wet ecosystem of the Koolau Mountains, at elevations generally between 1,900 and 2,500 ft (579 and 762 m) (U.S. Army 2006; TNC 2007; HBMP 2008). Historically, this species was found along the entire length of the Koolau range, and at elevations below 800 ft, from Pupukea to Wailupe Valley (HBMP 2008). Currently, 9 occurrences (totaling 32 individuals) are restricted to the summit area of the northern Koolau Mountains, with only 1 occurrence (16 individuals) near the summit of the southern Koolau Mountains (HBMP 2008).

Platydesma cornuta var. *decurrens* (NCN), a palmoid shrub in the rue family (Rutaceae), occurs in the lowland mesic and dry cliff ecosystems of the Waianae Mountains, at elevations generally between 1,990 and 3,000 ft (607 and 914 m) (Stone *et al.* 1999, pp. 1,209–1,210; U.S. Army 2006; TNC 2007; HBMP 2008). Historically this species was wide-ranging in the Waianae Mountains, from the Mokuleia Forest Reserve south to Kaluaa (TNC 2007; HBMP 2008). Currently, *P. cornuta* var. *decurrens* is found in 15 occurrences scattered from Pahole to Palawai Gulch, totaling 259 to 309 individuals (U.S. Army 2006; HBMP 2008).

Pleomele forbesii (hala pepe) is a tree in the asparagus (Asparagaceae) family (Smithsonian Department of Botany 2008). It occurs in mesic and dry forest and shrubland in the lowland dry, lowland mesic, lowland wet, and dry cliff ecosystems in the Waianae and Koolau Mountains, at elevations generally between 800 and 2,920 ft (244 and 890 m) (Wagner *et al.* 1999, p. 1,352; TNC 2007; HBMP 2008). Historically, *P. forbesii* was found in at least 11 areas, totaling an unknown number of individuals, in the Waianae Mountains (HBMP 2008). Currently, there are approximately 19 occurrences totaling 290 to 307 individuals, from the Mokuleia Forest Reserve, west to Keaau and south to Nanakuli, in the Waianae Mountains, and one occurrence of a few

individuals in the Koolau Mountains (J. Lau, in litt. 2008; HBMP 2008).

Psychotria hexandra ssp. *oahuensis* (kopiko), a tree in the coffee family (Rubiaceae), occurs in wet forest and shrubland in the lowland wet and wet cliff ecosystems of the Koolau Mountains, at elevations generally between 1,080 and 2,000 ft (329 and 610 m) (Wagner *et al.* 1999, p. 1,166; TNC 2007; HBMP 2008). Historically known only from the northern Koolau Mountains, this species is currently known from three occurrences in that area: one occurrence of 8 to 9 individuals in Maakua Gulch; 1 individual at Opaeula Gulch; and an estimated fewer than 10 individuals scattered between Kaipapau and Kaluanui, just south of Maakua Gulch (A. Bakutis, in litt. 2005; U.S. Army 2006; PEP Program 2007, p. 25; HBMP 2008). A single individual was outplanted within a fenced area in Makaua Valley (February 2007) and has been observed to be healthy in subsequent monitoring visits (PEP Program 2007, p. 25).

Pteralyxia macrocarpa (kaulu) is a tree in the dogbane family (Apocynaceae). It occurs in the Waianae and Koolau Mountains, in the lowland mesic, lowland wet, dry cliff, and wet cliff ecosystems, at elevations generally between 1,100 and 2,800 ft (335 and 850 m) (Wagner *et al.* 1999, p. 220; U.S. Army 2006; TNC 2007; HBMP 2008). Historically, this species was found along the entire length of the Koolau range and on the summit ridges of the Waianae Mountains (HBMP 2008). Currently, *P. macrocarpa* is found from Kapuhi Gulch to North Palawai Gulch in the Waianae Mountains, in approximately 31 occurrences totaling between 233 and 289 individuals. In the Koolau Mountains, 7 occurrences totaling 47 individuals occur in the most northern portion of this mountain range, while only 11 individuals in 2 occurrences are found in the southernmost portion of the range (U.S. Army 2006; HBMP 2008).

Tetraplasandra lydgatei (NCN), a tree in the ginseng family (Araliaceae), is found in mesic forest in the lowland mesic ecosystem at elevations generally between 800 and 1,600 ft (240 and 490 m) in the Koolau Mountains (Motley 2005, p. 107; TNC 2007). In 2005, Motley formally recognized *T. lydgatei* as distinct from *T. oahuensis* (Motley 2005; p. 105), and all known occurrences were surveyed at that time (PEP Program 2007, pp. 27–28). Formerly found from Niu Valley to the Halawa Ridge Trail, its distribution is now limited to two wild occurrences: one on the eastern slope of Hawaii Loa Ridge and another on the slopes of Kuliouou Valley. These occurrences total eight individuals (PEP Program 2007, pp. 27–28). In addition, 34 individuals have been outplanted in a fenced enclosure at Kulepeamoa Ridge (PEP Program 2007, p. 28).

Zanthoxylum oahuense (ae), a small tree in the rue family (Rutaceae), occurs in wet forest in the lowland wet ecosystem at elevations generally between 2,060 and 2,720 ft (628 and 829 m) (Wagner *et al.* 1999, p. 1,216; TNC 2007; HBMP 2008). This species was historically known from 17 areas along the entire length of the Koolau Mountains (HBMP 2008). Currently, *Z. oahuense* is restricted to the northern Koolau Mountains from Puu Kainapuaa along the summit to Waimano Stream, in 8 occurrences totaling approximately 29 individuals (U.S Army 2006; HBMP 2008).

Animals

The crimson Hawaiian damselfly is a medium-sized, slender and delicate species, with adults measuring from 1.4 to 1.6 in (36 to 41 mm) in length and having a wingspan of 1.5 to 1.6 in (39 to 42 mm). The species exhibits minimal striping and patterns. Males are primarily red and black in color, with females appearing somewhat paler and with green coloration present on the abdomen laterally (Polhemus and Asquith 1996, p. 65).

The crimson Hawaiian damselfly breeds in the slow reaches of streams and seep-fed pools (Williams 1936, p. 306; Zimmerman 1948a, p. 369; Polhemus 1994a, p. 7; Polhemus 1994b, p. 37). Crimson Hawaiian damselfly naiads, the aquatic life-history stage, frequent open water, resting horizontally, submerged below the surface, or on submerged vegetation (Williams 1936, p. 309). Adults perch on streamside vegetation and patrol along the stream corridor, staying close to breeding pools (Polhemus and Asquith 1996, p. 65).

Between 1991 and 2003, over 150 sites were surveyed on the island of Oahu for native damselflies, and results indicate that one lowland species, the Pacific Hawaiian damselfly, has been extirpated from Oahu, and the orangeblack Hawaiian damselfly has been reduced to a single remnant population (Polhemus 2007, pp. 233–235). The crimson Hawaiian damselfly was known historically from approximately eight areas where it is now extirpated, including the windward side of the Waianae Mountains and scattered locations in the Koolau Mountains (Polhemus 1994a, p. 7; Polhemus 1994b, pp. 37–38; Englund 1999, pp. 228–229, 231; Polhemus 2007, pp. 234, 238). In 2003, this species was not found during surveys of Kahana Stream and may be extirpated from this stream system (D. Polhemus, in litt. 2008). Currently, only five occurrences of the crimson Hawaiian damselfly are known, all from the Koolau Mountains in the lowland wet and wet cliff ecosystems at Waiawa, north Halawa, Punaluu, Moanalua, and Hauula (TNC 2007; D. Polhemus, in litt. 2008; HBMP 2008). All colonies of this damselfly are constrained to portions of streams not occupied by nonnative predatory fish—that is, stream portions above geologic or manmade barriers (e.g., waterfalls, steep gradients, dry stream midreaches, or constructed diversions). No estimates of population size for the crimson Hawaiian damselfly are available.

The blackline Hawaiian damselfly is a moderately-sized and delicate subspecies (Polhemus and Asquith 1996, p. 73). It occurs in and along the slow sections or pools of mid-reach and headwater sections of perennial upland streams and in seep-fed pools along overflow channels bordering such streams. The adults measure from 1.4 to 1.8 in (35 to 45 mm) in length and have a wingspan of 1.7 to 1.9 in (45 to 50 mm). Naiads remain concealed and are found in the water under stones or in mats of algae (Williams 1936, p. 318; Zimmerman 1948, pp. 371–372).

The blackline Hawaiian damselfly was known historically from the Koolau and Waianae Mountains, from sea level to over 2,400 ft (732 m) (Williams 1936, p. 318; Polhemus 1994a, pp. 6–12). Currently, this species is found in the lowland wet ecosystem on the windward and leeward sides of the Koolau Mountains, in the headwaters and upper reaches of 17 streams: Koloa, Kaluanui, Helemano, Poamoho, Kahana, Waikane, Waiahole, Waianu, Waiawa, Kaalaea, Waihee, Kahaluu, north Halawa, Heeia, Kalihi, Moole, and Maunawili (TNC 2007; D. Polhemus, in litt. 2008; R. Wolff, USGS, in litt. 2008; HBMP 2008). Like the crimson Hawaiian damselfly, all colonies of the blackline Hawaiian damselfly are constrained to portions of streams not occupied by nonnative predatory fish—that is, stream portions above geologic or manmade barriers (e.g., waterfalls, steep gradients, dry stream midreaches, or constructed diversions). Currently, the 17 stream colonies are estimated to total 800 to 1,000 individuals, with approximately 50 individuals per stream (D. Polhemus, in litt. 2008).

The oceanic Hawaiian damselfly is a comparatively large and robust species. The adults measure from 1.8 to 1.9 in (47 to 50 mm) in length and have a

wingspan of 2.0 to 2.2 in (51 to 55 mm). Both sexes exhibit prominent patterns including black stripes, but males are bright red in color while females are pale green. Immature individuals of this species are also large with long grasping legs and dagger-like gills (Polhemus and Asquith 1996, p. 77). The oceanic Hawaiian damselfly can be distinguished from other Oahu damselfly species by its large size, black stripes, and fast flight along flowing sections of streams.

Individuals of the immature stage of the oceanic Hawaiian damselfly are found in swiftly flowing sections of streams, usually amid rocks and gravel in stream riffles (stream sections with sufficient gradient to create small standing waves) and small cascades on waterfalls (Williams 1936, pp. 321–322; Polhemus and Asquith 1996, p. 106). While capable of swimming, the naiads usually crawl among gravel or submerged vegetation. Older naiads frequently forage out of the actual stream channel and have been observed among wet moss on rocks, and wet rock walls and seeps (Williams 1936, pp. 321–323). Adults are very bold and strong flyers, and when disturbed frequently fly upward into the forest canopy overhanging the stream or waterfall (Williams 1936, p. 323; Polhemus 1994b, p. 48).

Historically, the oceanic Hawaiian damselfly occurred on both the leeward and windward sides of the Koolau and Waianae Mountains, and was known, but is currently extirpated, from approximately 16 general localities, including the Waianae Mountains and all leeward streams of the Koolau Mountains (Englund and Polhemus 1994, p. 8). The species now currently occupies between 7 and 10 sites above 300 ft (100 m) in elevation on the windward side of the Koolau Mountains at Kaaawa, Kahaluu, Koloa, and Sacred Falls, in the lowland mesic, lowland wet, and wet cliff ecosystems (TNC 2007; Polhemus 2007, pp. 237–239; HBMP 2008). Like the crimson and blackline Hawaiian damselflies, the oceanic Hawaiian damselfly is constrained to portions of streams not occupied by nonnative predatory fish—that is, stream portions above geologic or manmade barriers (e.g., waterfalls, steep gradients, dry stream midreaches, or constructed diversions). No estimates of population size for the oceanic Hawaiian damselfly are available.

Summary of Factors Affecting the 23 Species Proposed 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. That evidence is discussed below for each of the species proposed for listing in this proposed rule.

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, we would then propose that species for listing when resources become available to do so. 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 23 species are summarized in Table 2, and discussed in detail below. Factor B (overutilization) is not included in the table, as no threats to the species fall under this category. If these species are listed under the Act, the final rule will refer readers to the proposed rule for the detailed discussion of threats, rather than republishing that information in the **Federal Register**.

Ecosystem Approach

Each of the species proposed for listing in this proposed rule is adversely affected by the threats to the ecosystems on which it depends. There is information available on many of the threats that act on Hawaiian ecosystems, and for some ecosystems, there is a growing body of literature regarding these threats (e.g., non-native ungulates and invasive plant species). The best available information on ecosystem threats affecting the species therein is discussed below. Table 2 identifies the threats to the ecosystems and the individual species within those ecosystems that are affected by those threats. Information on threats specific to certain species is also discussed where necessary and available; however, we acknowledge that we do not completely understand all the threats to each species. Scientific research directed toward each of these species is limited because of their rarity and the generally challenging logistics associated with conducting field work in Hawaii (e.g., areas are typically remote, difficult to survey in a comprehensive manner, and the target species are exceptionally uncommon).

Ecosystem-Scale Threats That Affect the Proposed Species

The following constitutes a list of ecosystem-scale threats that affect the proposed species in all of the seven ecosystems on Oahu:

(1) Foraging and trampling of native plants by goats (*Capra hircus*), pigs (*Sus scrofa*) and other ungulates, which results in severe erosion of watersheds because these mammals inhabit terrain that is often steep and remote (Cuddihy and Stone 1990, p. 63). These 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, which creates 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 the 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 reduces 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 the 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 2 below. The most-often cited effects of nonnative plants on native plant species are competition and displacement; competition may be for water 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 1995; Vitousek *et al.* 1987 in Cuddihy and Stone 1990, p. 74).

BILLING CODE 4310–55–P

TABLE 2. – SUMMARY OF PRIMARY THREATS IDENTIFIED FOR EACH OF THE 23 OAHU SPECIES

Species	Ecosystem	Factor A								Factor C			Factor D	Factor E
		Non-native plants	Pigs	Goats	Fire	Agriculture and urban development	Stream alteration	Stochastic events	Climate change	Predation by ungulates	Predation by other nonnative vertebrates	Predation by nonnative invertebrates	Inadequate existing regulatory mechanisms	Other species-specific threats
Bidens amplectens	*C, LD*	*X*	*X*	*X*	*X*			*H*	*X*	*X*			*X*	
Cyanea calycina	*LM, LW, MW, WC*	*X*	*X*	*X*	*X*				*X*	*X*	*R*	*S*	*X*	*T*
Cyanea lanceolata	*LM, LW*	*X*	*X*					*L, RF*	*X*	*X*	*R*	*S*	*X*	
Cyanea purpurellifolia	*LW, WC*	*X*	*X*						*X*	*X*		*S*	*X*	*LN*
Cyrtandra gracilis	*LW*	*X*	*X*						*X*	*X*	*R*	*S*	*X*	*LN*
Cyrtandra kaulantha	*LW, WC*	*X*	*X*					*L, RF, H*	*X*	*X*		*S*	*X*	*LN*
Cyrtandra sessilis	*LW, WC*	*X*	*X*					*L, RF, FL, H*	*X*	*X*		*S*	*X*	*T*
Cyrtandra	*LM, LW*	*X*	*X*						*X*	*X*		*S*	*X*	*LN*

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Species	Ecosystem	Factor A								Factor C			Factor D	Factor E
		Non-native plants	Pigs	Goats	Fire	Agricul-ture and urban develop-ment	Stream alter-ation	Stochastic events	Climate change	Predation by ungulates	Predation by other nonnative verte-brates	Predation by nonnative inverte-brates	Inadequate existing regulatory mechanisms	Other species-specific threats
waiolani														
Doryopteris takeuchii	*LD*	*X*			*X*			*L, RF*	*X*				*X*	*T*
Korthalsella degeneri	*DC*	*X*	*X*	*X*	*X*				*X*	*X*			*X*	*LHP*
Melicope christophersenii	*MW, WC*	*X*	*X*					*H*	*X*	*X*		*BTB*	*X*	
Melicope hiiakae	*LW*	*X*	*X*					*H*	*X*	*X*	*R*	*BTB*	*X*	*LN, T*
Melicope makahae	*LM, LW, DC*	*X*	*X*	*X*				*L, RF*	*X*	*X*		*BTB*	*X*	*NR*
Platydesma cornuta var. *cornuta*	LW	X	X					H	X	X			X	LN

TABLE 2. – SUMMARY OF PRIMARY THREATS IDENTIFIED FOR EACH OF THE 23 OAHU SPECIES

Species	Ecosystem	Factor A								Factor C			Factor D	Factor E
		Non-native plants	Pigs	Goats	Fire	Agriculture and urban development	Stream alteration	Stochastic events	Climate change	Predation by ungulates	Predation by other nonnative vertebrates	Predation by nonnative invertebrates	Inadequate existing regulatory mechanisms	Other species-specific threats
Platydesma cornuta var. *decurrens*	LM, DC	X	X	X				L, RF	X	X			X	
Pleomele forbesii	*LD, LM, LW, DC*	*X*	*X*	*X*	*X*				*X*	*X*		*TSL*	*X*	*NR*
Psychotria hexandra ssp. *oahuensis*	LW, WC	X	X					L, RF, FL, H	X	X	R		X	LN
Pteralyxia macrocarpa	*LM, LW, DC, WC*	*X*	*X*	*X*	*X*				*X*	*X*		*TSL*	*X*	
Tetraplasandra lydgatei	*LM*	*X*	*X*						*X*	*X*			*X*	*LN*
Zanthoxylum oahuense	LW	X	X						X	X		TSL	X	LN
Megalagrion	*LW, WC*					*X*	*X*	*D, L, RF,*	*X*		*FI, BF*	*A*	*X*	*LND*

TABLE 2. – SUMMARY OF PRIMARY THREATS IDENTIFIED FOR EACH OF THE 23 OAHU SPECIES

Species	Ecosystem	Factor A								Factor C			Factor D	Factor E
		Non-native plants	Pigs	Goats	Fire	Agriculture and urban development	Stream alteration	Stochastic events	Climate change	Predation by ungulates	Predation by other nonnative vertebrates	Predation by nonnative invertebrates	Inadequate existing regulatory mechanisms	Other species-specific threats
leptodemas								*FL, H*						
Megalagrion nigrohamatum nigrolineatum	LW					X	X	D, FL, H	X		FI, BF	A	X	LND
Megalagrion oceanicum	*LM, LW, WC*					*X*	*X*	*D, L, RF, FL, H*	*X*		*FI, BF*	*A*	*X*	*LND*

Factor A = Habitat Modification
Factor C = Disease or Predation
Factor D = Inadequacy of Regulatory Mechanisms
Factor E = Other Species-Specific Threats
C = Coastal
LD = Lowland Dry
LM = Lowland Mesic
LW = Lowland Wet
MW = Montane Wet
DC = Dry Cliff
WC = Wet Cliff
L = Landslides
RF = Rockfalls
FL = Flooding
H = Hurricanes
S = Slugs
BTB = Black Twig Borer
TSL = Two-spotted Leafhopper
A = Ants
D = Drought
FI = Fish
R = Rats
BF = Bullfrogs
LN = Limited Numbers Plants (≤ 50 individuals)
LND = Limited Numbers Damselflies (≤ 20 populations)
NR = No Regeneration
T = Trampling
LHP = Loss of Host Plants

BILLING CODE 4310–55–C

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 on the Hawaiian Islands are two bat taxa, the 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; many of the native species lost unneeded defenses against threats such as mammalian predation and competition with aggressive, weedy plant species that are typical of mainland environments (Loope 1992, p. 11; Gagne and Cuddihy 1999, p. 45; Wagner *et al.* 1999, pp. 3–6). For example, Carlquist (in Carlquist and Cole 1974, p. 29) notes that ''Hawaiian plants are notably nonpoisonous, free from armament, and free from many characteristics thought to be deterrents to herbivores (oils, resins, stinging hairs, coarse texture).'' In addition, species restricted to highly specialized locations or food sources (e.g., some Hawaiian damselflies) 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 1992, pp. 88–102).

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 (U.S. Geological Survey 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 (Cox 1992, pp. 116–117). The presence of introduced alien mammals is considered one of the primary factors underlying the alteration and degradation of native vegetation and habitats on the island of Oahu (Cox 1992, pp. 118–119). Six of the seven ecosystems (lowland dry, lowland mesic, lowland wet, montane wet, dry cliff, and wet cliff) and their associated species are currently threatened by the destruction or degradation of habitat due to nonnative ungulates (hoofed mammals), including pigs (*Sus scrofa*) and goats (*Capra hircus*) (HBMP 2008). Only the coastal ecosystem on Oahu is not currently threatened by nonnative ungulates (S. Perlman, in litt. 2007).

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. They are currently present on Kauai, Niihau, Oahu, Molokai, Maui, and Hawaii. 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 in Loope 1998, pp. 752–753).

These introduced pigs 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. They may also reduce or eliminate plant regeneration by damaging or eating seeds and seedlings. Further discussion of predation by nonnative ungulates is 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 coats as well as through the spread of their feces (Diong 1982, pp. 169–170), and by fertilizing the disturbed soil with their feces (Matson 1990, p. 245; Siemann *et al.* 2009, p. 547). Pigs feed preferentially 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. 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).

Goats native to the Middle East and India were also successfully introduced to the Hawaiian Islands in the late 1700s. Actions to control goat populations began in the 1920s (Tomich 1986, pp. 152–153). Feral goats now occupy a wide variety of habitats on Oahu, where they consume native vegetation, trample roots and seedlings, accelerate erosion, and promote the invasion of alien plants that have greater competitive abilities (van Riper and van Riper 1982, pp. 34–35; Stone 1985, p. 261). 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 natural vegetation and contribute to erosion by: (1) Eating young trees and young shoots of plants before they can become established; (2) creating trails that can damage native vegetative cover, destabilize substrate and create gullies that convey water; and (3) dislodging stones from ledges that can cause rockfalls and landslides that damage vegetation below (Cuddihy and Stone 1990, pp. 63–64).

The species proposed for listing dependent on the lowland dry, lowland mesic, lowland wet, montane wet, dry cliff, and wet cliff ecosystems are exposed to direct and indirect negative impacts of feral ungulates (pigs and goats), which result in the destruction and degradation of habitat for these native Oahu species. The effects of these nonnative animals include: (1) The destruction of vegetative cover; (2) trampling of plants and seedlings; (3) direct consumption of native vegetation; (4) soil disturbance; (5) dispersal of alien plant seeds on hooves, coats, and through the spread of seeds in feces; and (6) the 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 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. Over 800 plant taxa have been introduced from outside Hawaii, and nearly 100 of these have become pests (e.g., injurious plants) (Smith 1985, p. 180; Cuddihy and Stone 1990, p. 73; Gagne and Cuddihy 1999, p. 45). Of these 100 nonnative plant species, over 50 species have altered the habitat of 20 of the 23 species proposed for listing on Oahu. Some of these plants were brought to Hawaii by various groups of people, for food or cultural reasons, to reforest native forests destroyed by grazing feral and domestic animals, for pasture for domestic animals, and for other agricultural purposes. 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 seven Oahu ecosystems and the 20 plant species identified in this proposed rule, by: (1) Modifying the availability of light; (2) altering soil-water regimes; (3) modifying nutrient cycling; (4) altering fire characteristics of 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). Nonnative plants (and animals) have contributed to the extinction of native species in the lowlands of Hawaii and have been a primary cause of extinction in upland habitats (Vitousek *et al.* 1987, in Cuddihy and Stone 1990, p. 74). The most-often cited effects of nonnative plants on native plant species are displacement through competition. Competition may be for water or nutrients, or it may involve allelopathy (chemical inhibition of other plants) (Smith 1985, in Cuddihy and Stone 1990, p. 74). Nonnative plants may also displace native species by preventing their reproduction, usually by shading and taking up available sites for seedling establishment (Vitousek *et al.* 1987, in Cuddihy and Stone 1990, p. 74).

Alteration of fire regimes clearly represents an ecosystem-level change caused by the invasion of nonnative grasses (D'Antonio and Vitousek 1992, p. 73). The grass life form supports standing dead material that burns readily, and grass tissues have large surface/volume ratios and can dry out quickly (D'Antonio and Vitousek 1992, p. 73). The flammability of biological materials is determined primarily by their surface/volume ratio and moisture content, and secondarily by mineral content and tissue chemistry (D'Antonio and Vitousek 1992, p. 73). The finest size classes of material (mainly grasses) ignite and spread fires under a broader range of conditions than do woody fuels or even surface litter (D'Antonio and Vitousek 1992, p. 73). The grass life form allows rapid recovery following fire; there is little above-ground structural tissue, so almost all new tissue fixes carbon and contributes to growth (D'Antonio and Vitousek 1992, p. 73). Grass canopies also support a microclimate in which surface temperatures are hotter, vapor pressure deficits are larger, and the drying of tissues more rapid than in forests or woodlands (D'Antonio and Vitousek 1992, p. 73). Thus, conditions that favor fire are much more frequent in grasslands (D'Antonio and Vitousek 1992, p. 73). In summary, nonnative plants directly and indirectly affect the plant species proposed for listing by modifying or destroying their terrestrial habitat. 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 proposed species.

Nonnative Plants in the Coastal Ecosystem

Nonnative plant threats to *Bidens amplectens,* the only species proposed for listing in this proposed rule that inhabits the coastal ecosystem on Oahu, include the understory and subcanopy species *Asystasia gangetica* (Chinese violet), *Atriplex semibaccata* (Australian saltbush), *Leucaena leucocephala* (koa haole), *Pluchea indica* (Indian fleabane), *P. carolinensis* (sourbush), and *Verbesina encelioides* (golden crown-beard) (DOFAW 2007, pp. 20–22, 54–58; HBMP 2008). Nonnative canopy species includes *Prosopis pallida* (kiawe) (DOFAW 2007, pp. 20–22, 54–58; HBMP 2008). In addition, *Bidens amplectens* is threatened by several nonnative grasses such as *Cenchrus ciliaris* (buffelgrass), *Chloris barbata* (swollen fingergrass), *Digitaria insularis* (sourgrass), and *Panicum maximum* (guinea grass) in this ecosystem (DOFAW 2007, pp. 20–22, 54–58; HBMP 2008). These nonnative plant species pose a serious threat (see ''*Specific Nonnative Plant Species Impacts,''* below) to *Bidens amplectens* in this ecosystem.

Nonnative Plants in the Lowland Dry Ecosystem

Nonnative plant threats to *Bidens amplectens, Doryopteris takeuchii,* and *Pleomele forbesii,* the three species proposed for listing in this proposed rule that inhabit the lowland dry ecosystem include the understory and subcanopy species *Leonotis nepetifolia* (lion's ear), *Passiflora foetida* (love-in-a-mist), *P. suberosa* (huehue haole), and *Stapelia gigantea* (giant toad plant) (HBMP 2006; Perlman 2007a, p. 3; HBMP 2008). Canopy species include *Aleurites moluccana* (kukui), *Grevillea robusta* (silk oak), *Leucaena leucocephala, Psidium cattleianum, P. guajava* (common guava), *Schinus terebinthifolius* (Christmas berry), and *Syzygium cumini* (Java plum) (Perlman 2007a, p. 7; HBMP 2006; HBMP 2008). In addition, *Bidens amplectens, Doryopteris takeuchii,* and *Pleomele forbesii* are threatened by several nonnative grasses such as *Andropogon virginicus* (broomsedge), *Cenchrus ciliaris, Melinis minutiflora* (molasses grass), *Panicum maximum,* and *Pennisetum setaceum* (fountain grass) in this ecosystem (HBMP 2006; Perlman 2007a, p. 3; HBMP 2008). These nonnative plant species pose a serious threat (see ''*Specific Nonnative Plant Species Impacts,''* below) to the three species proposed for listing that depend on this ecosystem.

Nonnative Plants in the Lowland Mesic Ecosystem

Nonnative plant threats to the eight plant species (*Cyanea calycina, Cyanea lanceolata, Cyrtandra waiolani, Melicope makahae, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa,* and

Tetraplasandra lydgatei) proposed for listing in this proposed rule that inhabit the lowland mesic ecosystem include the understory and subcanopy species *Ageratina riparia* (Hamakua pamakani), *Ardisia elliptica* (shoebutton ardisia), *Blechnum appendiculatum* (no common name (NCN)), *Buddleia asiatica* (dog tail), *Clidemia hirta* (Koster's curse), *Erigeron karvinskianus* (daisy fleabane), *Kalanchoe pinnata* (air plant), *Lantana camara* (lantana), *Passiflora suberosa, Rubus argutus* (prickly Florida blackberry), and *R. rosifolius* (thimbleberry) (TNC 1997, pp. 10, 15; HBMP 2008). Canopy species include *Aleurites moluccana, Ficus microcarpa* (Chinese banyan), *Grevillea robusta, Heliocarpus popayanensis* (moho), *Morella faya* (firetree), *Psidium cattleianum, P. guajava, Schefflera actinophylla* (octopus tree), *Schinus terebinthifolius, Syzygium cumini, S. jambos* (rose apple), *Tecoma stans* (yellow elder), and *Toona ciliata* (Australian red cedar). An additional threat is the nonnative grass *Melinus minutiflora* (TNC 1997, p. 15; Motley 2005, p. 109; HBMP 2008). These nonnative plant species pose a serious threat (see ''*Specific Nonnative Plant Species Impacts,''* below) to all eight of the species proposed for listing that are dependent on this ecosystem.

Nonnative Plants in the Lowland Wet Ecosystem

Nonnative plant threats to the 14 plant species (*Cyanea calycina, C. lanceolata,* C. *purpurellifolia, Cyrtandra gracilis, C. kaulantha, C. sessilis, C. waiolani, Melicope hiiakae, M. makahae, Platydesma cornuta* var. cornuta, *Pleomele forbesii, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa,* and *Zanthoxylum oahuense*) proposed for listing in this proposed rule that inhabit the lowland wet ecosystem include the understory and subcanopy species *Ageratina riparia, Blechnum appendiculatum, Buddleia asiatica, Clidemia hirta, Erechtites valerianifolia* (fireweed), *Kalanchoe pinnata, Passiflora suberosa, Pterolepis glomerata* (NCN), *Rubus argutus, R. rosifolius,* and *Sphaeropteris cooperi* (Australian tree fern), and the canopy species *Aleurites moluccana, Ardisia elliptica, Chrysophyllum oliviforme* (satinleaf), *Heliocarpus popayanensis, Leptospermum scoparium* (tea tree), *Morella faya, Pimenta dioica* (allspice), *Psidium cattleianum, P. guajava,* and *Schinus terebinthifolius* (TNC 1997, p. 10; U.S. Army 2006; HBMP 2008). Nonnative grasses that are threats to the 14 plant species proposed for listing in this ecosystem are *Andropogon virginicus, Axonopus fissifolius* (narrow-leaved carpetgrass), *Melinus minutiflora, Oplismenus hirtellus* (basketgrass), *Sacciolepis indica* (glenwood grass), and *Urochloa mutica* (California grass) (TNC 1997, p. 10; Erickson and Puttock 2006, p. 270; U.S. Army 2006). These nonnative plant species pose a serious threat (see ''*Specific Nonnative Plant Species Impacts,''* below) to the 14 plants proposed for listing that inhabit this ecosystem.

Nonnative Plants in the Montane Wet Ecosystem

Nonnative plant threats to *Cyanea calycina* and *Melicope christophersenii,* proposed for listing in this proposed rule that inhabit the montane wet ecosystem include the understory and subcanopy species *Clidemia hirta* and *Rubus argutus,* and the canopy species *Psidium cattleianum* (HBMP 2008). These nonnative plant species pose a serious threat (See ''Specific Nonnative Plant Species Impacts,'' below) to the two proposed species dependent on this ecosystem.

Nonnative Plants in the Dry Cliff Ecosystem

Nonnative plant threats to the five plant species (*Korthasella degeneri, Melicope makahae, Platydesma cornuta* var. *decurrens, Pleomele forbesii,* and *Pteralyxia macrocarpa*) which are proposed for listing in this proposed rule and that inhabit the dry cliff ecosystem include the understory and subcanopy species *Ageratina riparia, Blechnum appendiculatum, Clidemia hirta, Erigeron karvinskianus, Kalanchoe pinnata, Lantana camara, Passiflora suberosa,* and *Sphaeropteris cooperi,* and the canopy species *Acacia confusa* (Formosa koa), *Aleurites moluccana, Grevillea robusta, Leucaena leucocephala, Melia azederach* (Chinaberry), *Psidium cattleianum, P. guajava, Schinus terebinthifolius, Syzygium cumini, Tecoma stans,* and *Toona ciliata* (HBMP 2008). Nonnative grasses that are a threat to this ecosystem include *Digitaria insularis* (sourgrass), *Ehrharta stipoides* (meadow ricegrass), *Melinus minutiflora, Panicum maximum,* and *Paspalum conjugatum* (Hilo grass) (HBMP 2008). These nonnative plant species pose a serious threat (see ''*Specific Nonnative Plant Species Impacts,''* below) to the five species proposed for listing that are dependent on this ecosystem.

Nonnative Plants in the Wet Cliff Ecosystem

Nonnative plant threats to the seven plant species (*Cyanea calycina, C. purpurellifolia, Cyrtandra kaulantha, C. sessilis, Melicope christophersenii, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa*) proposed for listing in this proposed rule that inhabit the wet cliff ecosystem include the understory and subcanopy species *Blechnum appendiculatum, Clidemia hirta, Erechtites valerianifolia, Erigeron karvinskianus, Passiflora suberosa, Pterolepis glomerata, Rubus argutus, R. rosifolius,* and the canopy species *Ardisia elliptica, Buddleia asiatica, Heliocarpus popayanensis, Psidium cattleianum, P. guajava, Schinus terebinthifolius,* and *Toona ciliata* (HBMP 2008). Nonnative grasses that are a threat to this ecosystem include *Axonopus fissifolius, Melinus minutiflora, Oplismenus hirtellus,* and *Paspalum conjugatum* (HBMP 2008). These nonnative plant species pose a serious threat (see ''*Specific Nonnative Plant Species Impacts,''* below) to all seven of the proposed plant species dependent on this ecosystem.

Specific Nonnative Plant Species Impacts

To reiterate, nonnative plants represent a serious and ongoing threat to each of the 20 plant species proposed for listing in this proposed rule throughout their ranges by destroying and modifying habitat. Nonnative plants can adversely impact microhabitat by modifying the availability of light and nutrient cycling processes, and by altering soil-water regimes. They can also alter fire characteristics of native plant habitat, leading to incursions of fire-tolerant, nonnative plant species in native habitat. Nonnative plants outcompete native plants by growing faster, and some may release chemicals that inhibit the growth of other plants. By outcompeting native plants, nonnative plants 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 specific nonnative plants that present a threat to the species proposed for listing in this proposed rule because they threaten the ecosystems in which the plant species occur.

• *Acacia confusa* is a tree introduced to Hawaii from Taiwan and the Philippine Islands about 1915 by the Board of Agriculture and Forestry and the Hawaiian Sugar Planter's Association for use as a windbreak (Geesink *et al.* 1999, p. 641). This species forms monotypic stands at lower elevations that prevent establishment of native plants. Seeds present in the ground germinate profusely after fire, outcompeting native plants (Pacific

Island Ecosystems at Risk (PIER) 2008a). This species occurs in dry to mesic disturbed habitats (Wagner *et al.* 1999, p. 640).

• *Ageratina riparia* is a subshrub that spreads from a creeping rootstock (Wagner *et al.* 1999, p. 255). This species forms dense mats, preventing regeneration of native plants (Davis *et al.* 1992, p. 427), and occurs in dry, disturbed habitats and mesic and wet forests (Wagner *et al.* 1999, p. 255).

• *Aleurites moluccana* is a spreading, tall tree native to Malesia, 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.* 1999, 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 2008b). The species tolerates a wide range of soil conditions and forms dense thickets, which increases its competitive abilities over native plants. This species occurs in mesic valley habitats (Wagner *et al.* 1999, p. 599).

• *Andropogon virginicus* is a fire-adapted bunch grass with seeds that are easily distributed by wind, clothing, vehicles, and feral animals (Smith 1989, p. 63). It can outcompete and displace native plants. Some research suggests that this species may also release allelopathic substances (chemicals that inhibit growth of other plants) that dramatically decrease the reestablishment of native plants (Rice 1972, p. 752). This species has become dominant in areas subjected to natural or human-induced fires (Wagner *et al.* 1999, p. 77). This species is on the Hawaii State noxious weed list (HAR Title 4, Subtitle 6, Chapter 68), and occurs in disturbed, dry to mesic forests and shrubland habitats, especially on ridges (Wagner *et al.* 1999, p. 1497).

• *Ardisia elliptica* is a branched shrub native to Sri Lanka that is now naturalized (i.e., introduced by man from another area, and established and reproducing itself in the wild) in Hawaii (Wagner *et al.* 1999, 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 can 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). This species occurs in mesic forest habitats and the lower portions of wet forests (Wagner *et al.* 1999, p. 933).

• *Asystasia gangetica,* a perennial herb native to India, Malay Peninsula, and Africa, is naturalized in disturbed habitats in Hawaii. This species can grow over shrubs and smother all vegetation in the herbaceous layer, covering native plants and preventing their establishment (Smith 1985, p. 185). According to the Hawaii Weed Risk Assessment for *A. gangetica,* this species has a high risk of invasiveness or a high risk of becoming a serious pest (PIER 2009). This species occurs in low-elevation, disturbed habitats (Wagner *et al.* 1999, p. 168).

• *Atriplex semibaccata* is a drought- and saline-tolerant, low-growing shrub, that forms dense spreading mats that displace native plants. It was introduced to Hawaii around 1895, as an experimental forage grass plant for cattle, and is now naturalized in dry to seasonally wet areas (Wagner *et al.* 1999, p. 535). The seeds are attractive to fruit eaters, which may help disperse this plant (California Invasive Plant Council 2006). This species occurs in dry to seasonally wet habitat areas (Wagner *et al.* 1999, p. 535).

• *Axonopus fissifolius* 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). This species occurs in wet pastures, disturbed wet forests, and bogs (Wagner *et al.* 1999, p. 1,502).

• *Blechnum appendiculatum* is a fern with fronds to 23 in (60 cm) long that forms large colonies in closed canopy mesic forests, especially on rocky substrate. It occurs in all but the most extreme habitats (Palmer 2003, p. 81).

• *Buddleia asiatica* 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 even lava and cinder substrate areas in Hawaii, displacing native vegetation (Wagner *et al.* 1999, p. 415; PIER 2008d). This species occurs in lava, cinder fields, and wet forest habitats (Wagner *et al.* 1999, p. 416).

• *Cenchrus ciliaris* is native to Africa and tropical Asia and is naturalized in Hawaii. It is a fire-adapted grass that provides fuel for fires and recovers quickly, increasing its cover with each succeeding fire (PIER 2007a), because it can reproduce through vegetative fragmentation and be dispersed by animals or other vectors, increasing its competitive abilities over native plants. This species occurs in dry areas and sandy soil, in a variety of habitat types (Wagner *et al.* 1999, p. 1,512).

• *Chloris barbata,* native to Central America, West Indies, and South America, is widely naturalized in Hawaii (O'Connor 1999, p. 1,514). This species first evolved resistance to Group C1/5 herbicides in Hawaii in 1987. The species infests roadsides and sugarcane plantations, and encroaches on native habitat (WeedScience.com 2009; HBMP 2008). According to the Hawaii Weed Risk Assessment for *C. barbata,* this species has a high risk of invasiveness or a high risk of becoming a serious pest (PIER 2008e) because of its ability to outcompete native species. This species occurs in dry disturbed areas, roadsides, vacant lots, and pastures (Wagner *et al.* 1999, p. 1,514).

• *Chrysophyllum oliviforme* 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 2006a). Birds easily disperse the fleshy fruit, and the species becomes a dominant component over native forest (Pennington 1999, p. 1,231; Maui Land and Pineapple Company 2002, pp. A 1–4). 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 2006a). This species has been documented in low-elevation moist forests.

• *Clidemia hirta* is a noxious shrub in the Melastomataceae family that forms a dense understory, shades out native plants and prevents their regeneration, and is considered a significant nonnative plant threat (Wagner *et al.* 1985, p 41; Smith 1989, p. 64). All plants in the Melastomataceae family are legally designated ''noxious'' in the State of Hawaii (HAR Title 4, Subtitle 6, Chapter 68). This species has been documented in forests and pastures (*http://www.ctahr.hawaii.edu/invweed/weedsHI.html*).

• *Digitaria insularis* is a densely tufted, perennial grass that is 3.2 to 5 ft (100 to 150 cm) tall. It is native to the neotropics, and is widely naturalized on Hawaiian and other Pacific islands, and in Malesia (O'Connor 1999, p. 1,531). It forms dense mats, crowding out native species (Motooka *et al.* 2003a), and occurs in lawns and pastures (Wagner *et al.* 1999, p. 1,531).

• *Ehrharta stipoides* is a grass that creates a thick mat in which other species cannot regenerate; its seeds are easily dispersed by awns (slender, terminal bristle-like process found at the

spikelette in many grasses) that attach to fur or clothing (U.S. Army Garrison 2006, p. 2–1–20). This species has been documented in dry to mesic areas between elevations of 330 to 1700 ft (100 to 500 m) *Erechtites valerianifolia* 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.* 1999, p. 314). This species occurs in relatively wet disturbed habitats (Wagner *et al.* 1999, p. 314).

• *Erigeron karvinskianus* 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 2006), and occurs in moderately wet habitats (Wagner *et al.* 1999, *p.* 315).

• *Ficus microcarpa* is a very large, spreading tree with numerous aerial roots that form columnar stems. It is epiphytic and can germinate on other trees, eventually strangling its host, and can shade out native plants with its broad canopy. Seeds are spread by birds (Motooka *et al.* 2003b). This species occurs in highly disturbed low-elevation habitats (Wagner *et al.* 1999, p. 926).

• *Grevillea robusta* is a large evergreen tree 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. The leaves produce an allelopathic substance that inhibits the establishment of all species (Smith 1985, p. 191). This species has been documented in dry and moist forests, and open areas.

• *Heliocarpus popayanensis* is a tree native to Mexico and Argentina, planted extensively in Hawaii by foresters beginning in 1941, and has since escaped into wet forests at low to mid elevations (Wagner *et al.* 1999, p. 1,292). The seeds are dispersed by wind, and *H. popayanensis* is becoming a dominant tree in some forest areas on Oahu (Smith 1998). The species grows rapidly and spreads readily in disturbed wetter mesic forest habitats, where it can outcompete native vegetation (Mootka 2003c). This species occurs in disturbed forest habitats (Wagner *et al.* 1999, p. 1292).

• *Kalanchoe pinnata* is a succulent perennial plant with hollow stems that can form dense stands that prevent reproduction of native species. It can also reproduce by vegetative means at indents along the leaf margin (Motooka *et al.* 2003c). This species occurs in low-elevation, dry to mesic, disturbed habitats (Wagner *et al.* 1999, p. 568).

• *Lantana camara* was brought to Hawaii as an ornamental plant, and is an aggressive, thorny, thicket-forming shrub that is now found on all of the main islands (Davis *et al.* 1992, p. 412; Wagner *et al.* 1999, p. 1,320). It forms dense impenetrable stands that negatively affect native plants through competition (Mootka 2003d), and occurs in mesic forest, dry shrubland, and dry/disturbed low elevation habitats (Wagner *et al.* 1999, p. 1320).

• *Leonotis nepetifolia* is a coarse annual herb that is widely naturalized and forms dense thickets that displace native plants. According to the Hawaii Weed Risk Assessment for *L. nepetifolia,* this species has a high risk of invasiveness or a high risk of becoming a serious pest (PIER 2006b). This species occurs in low-elevation, dry to occasionally wet, disturbed habitats (Wagner *et al.* 1999, p. 803).

• *Leptospermum scoparium* is a shrub or small tree native to New Zealand and Australia, which is now widely naturalized in Hawaii. It forms thickets that crowd out other plants, and is allelopathic (produces chemicals that inhibit growth of other plants) (Smith 1985, p. 193)). This species occurs in disturbed, mesic to wet, forest habitats (Wagner *et al.* 1999, p. 963).

• *Leucaena leucocephala,* a shrub native to the neotropics, is now found on all of the main Hawaiian Islands and Midway atoll. It is 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).

• *Melia azedarach* is a small, deciduous tree native to southwestern Asia that is invading forests, fence lines, and disturbed areas in Hawaii. Its fast growth and rapidly spreading thickets make it a significant pest plant by shading out and displacing native vegetation (University of Florida 2008). Feral pigs and fruit-eating birds further distribute the seeds (Stone 1985, pp. 194–195). According to the Hawaii Weed Risk Assessment for *M. azedarach,* this species has a high risk of invasiveness or a high risk of becoming a serious pest (PIER 2008f). This species occurs in dry, disturbed habitats (Wagner *et al.* 1999, p. 918).

• *Melinus minutiflora* is a spreading, perennial grass that forms dense mats that can fuel more intense fires that destroy native plants (Cuddihy and Stone 1990, p. 89; O'Connor 1999, p. 1,562). This species occurs in dry to mesic habitats, in disturbed and usually open areas (Wagner *et al.* 1999, p. 1563).

• *Morella faya* 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 birds and feral pigs (Vitousek 1990, pp. 8–9; Wagner *et al.* 1999, p. 931; PIER 2008g). This species is on the Hawaii State noxious weed list (HAR Title 4, Subtitle 6, Chapter 68). The species has been documented in forested habitats (*http://www.hawaiiinvasivespecies.org/pests/firetree.html*).

• *Oplismenus hirtellus* 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). The species displaces native plants on forest floors and trailsides (Motooka 2003e), and occurs in shaded mesic valleys, mesic forest, and disturbed wet forest habitats (Wagner *et al.* 1999, p. 1,565).

• *Panicum maximum* is cultivated as an important forage grass throughout the tropics and is naturalized in Hawaii (O'Connor 1999, p. 1,569). This tall grass produces profuse seeds that are spread by wind, birds, and flowing water. This plant is strongly allelopathic (PIER 2007b), and can form dense stands that exclude native species. It regenerates rapidly from underground rhizomes after a fire (PIER 2007b). This species has been documented in open disturbed areas of forests, wastelands, and roadsides (*http://www.ctahr.hawaii.edu/invweed/weedsHi.html*).

• *Paspalum conjugatum* 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 (Tomich 1986, p. 125; Cuddihy and Stone 1990, p. 83; PIER 2007c; Motooka *et al.* 2003d). This species occurs in moist to wet disturbed habitats (Wagner *et al.* 1999, p. 1,576).

• *Passiflora foetida is* a vine with glandular hairs that give the plant a fetid odor. This species is naturalized in Hawaii, and grows over and covers low vegetation that prevents or delays establishment of native species. Its fruit are eaten and spread by birds (Escobar 1999, p. 1,011; GISD 2006). This species occurs in disturbed sites and rock outcrop habitats (Wagner *et al.* 1999, p. 1,011).

• *Passiflora suberosa* has many-seeded purple fruits that are dispersed widely by birds. It is an aggressive vine that grows over and smothers shrubs, small trees, and ground layer vegetation, and sometimes upper canopy layer vegetation (Smith 1985, pp. 191–192). This species occurs in grassland, shrubland, open dry forest, mesic forest, and exposed ridge habitats (Wagner *et al.* 1999, p. 1,014).

• *Pennisetum setaceum* is a grass that is an aggressive colonizer, and outcompetes most native species. This species is also fire-adapted and burns swiftly and hot, causing extensive damage to the surrounding habitat (O'Connor 1999, p. 1,581). This species occurs in dry open places, barren lava flows, and cinder fields (Wagner *et al.* 1999, p. 1,578).

• *Pimenta dioica* is a tree with sticky grape-like seeds that are spread by birds. Widely cultivated, this species was introduced to Hawaii in 1885, and is believed to be naturalized on Kauai and perhaps on Oahu (Staples and Herbst 2005, p. 427). According to the Hawaii Weed Risk Assessment for *P. dioica,* this species has a high risk of invasiveness or a high risk of becoming a serious pest (PIER 2008h). The species forms dense thickets, tolerates a wide range of soil conditions, and has propagules that survive passage through bird digestive systems. These capabilities increase its competitive ability over native plants. This species has been documented in dry and moist forests up to elevation 3,000 ft.

• *Pluchea indica* is native to southern Asia, and *P. carolinensis* is native to Mexico, the West Indies, and South America (Wagner *et al.* 1999, 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 2006). The species is adapted to a wide variety of soils and sites, 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, it is soon replaced by other species. These adaptive capabilities increase the species' competitive abilities over native plants. This species occurs in low-elevation, dry, coastal habitats (Wagner *et al.* 1999, p. 351).

• *Pluchea carolinensis* is native to Mexico, the West Indies, and northern South America. The species has naturalized in Hawaii, usually in relatively dry, coastal areas, but ranging up to 3,000 ft (900 m) in mesic to wet forest. The species was first collected on Oahu in 1931 (Wagner *et al.,* 1999. p. 351). This fast-growing shrub forms thickets in dry habitats. The seeds are wind-dispersed. Its resistance to fire depends on the intensity of the fire. It generally regenerates from basal shoots. Some biological control agents have been introduced but they have not been effective (*http://www.botany.hawaii.edu/faculty/cw_smith/plu_sym.htm*).

• *Prosopis pallida* was introduced to Hawaii in 1828, and its seeds were used as fodder for ranch animals. This species became a dominant component of the vegetation in low-elevation, dry, disturbed sites, as it is well adapted to dry habitats. It overshadows other vegetation and the deep tap roots use all available water. This plant fixes nitrogen and can outcompete native species (Geesink *et al.* 1999, pp. 692–693; PIER 2006c). This species occurs in low-elevation, dry, disturbed habitats; behind beaches; on raised limestone reefs; on dry slopes and bulches; and in degraded dry forest habitats (Wagner *et al.* 1999, p. 693).

• *Psidium cattleianum* 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 pigs and birds that disperse the seeds throughout the forest (Smith 1985, p. 200; Wagner *et al.* 1985, p. 24). This species occurs in disturbed, mesic forest and wet forest habitats (Wagner *et al.* 1999, p. 970).

• *Psidium guajava* is a shrub or tree that forms dense stands in disturbed forest. The seeds are spread by feral pigs and alien birds, and it can also regenerate from underground parts by suckering (Wagner *et al.* 1999, p. 972). Seeds are dispersed throughout the forest, which facilitates competition with native plants. This species occurs in disturbed, dry, mesic and wet, forest habitats (Wagner *et al.* 1999, p. 972).

• *Pterolepis glomerata* is a member of the Melastomataceae family. The basis for its classification as invasive are the plant's germination rates, rapid growth, early maturity, ability of fragments to root, possible asexual reproduction, and seed dispersal by birds (University of Florida Herbarium 2006). Because of these attributes, it displaces native vegetation through competition. This species is on the Hawaii State noxious weed list (HAR Title 4, Subtitle 6, Chapter 68). This species occurs in disturbed, mesic to wet habitats and trail margins (Wagner *et al.* 1999, p. 913).

• *Rubus argutus* is a prickly bramble with long, arching stems that 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.* 1999, 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 (HAR Title 4, Subtitle 6, Chapter 68). This species occurs in mesic to wet forest and subalpine grassland habitats (Wagner *et al.* 1999, p. 1,107).

• *Rubus rosifolius* 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 2008a; PIER 2008i). This species occurs in disturbed, mesic to wet, forest habitat (Wagner *et al.* 1999, p. 1,110).

• *Sacciolepis indica* is an annual grass that invades disturbed and open areas in wet habitats, and outcompetes native plants. The seeds are dispersed by sticking to animal fur (University of Hawaii 1998). This species occurs in open, wet areas such as grasslands, ridge crests, openings in wet forest, and along trails (Wagner *et al.* 1999, p. 1589).

• *Schefflera actinophylla* is a tree native to Australia and New Guinea, and now naturalized in Hawaii (Lowry 1999, p. 232). This species is shade tolerant and can spread into undisturbed forests, forming dense thickets. *Schefflera actinophylla* grows epiphytically, strangling host trees, and its numerous seeds are readily dispersed by birds (PIER 2008j). This species occurs in low-elevation, disturbed, mesic habitats (Wagner *et al.* 1999, p. 232).

• *Schinus terebinthifolius* forms dense thickets in all habitats, and its red berries are attractive to 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. This species occurs in disturbed, mesic habitats (Wagner *et al.* 1999, p. 195).

• *Sphaeropteris cooperi* 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 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). This species has been documented in rain forest, moist forest, and openings in wet and moist areas.

• *Stapelia gigantea* is a succulent, cactus-like plant native to tropical Africa and Mozambique (Wagner *et al.* 1999, p. 241). It can compete with native species for space and water in exposed areas. This species has been documented in dry forests and open areas.

• *Syzygium cumini* is a tree that 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 2008k). This species occurs in mesic valleys and disturbed mesic forest habitats (Wagner *et al.* 1999, p. 168).

• *Syzygium jambos* has fruit that are dispersed by birds as well as by humans, and possibly by pigs. This tree is detrimental to native ecosystems because it does not need disturbance to become established, and can germinate and thrive in shade, eventually overtopping and replacing native canopy trees (U.S. Army 2006, p. 2–1–23). This species occurs in low-elevation, mesic to wet sites, primarily valleys and occasionally in disturbed, mesic forest habitats (Wagner *et al.* 1999, p. 975).

• *Tecoma stans* is a shrub or small tree that can form dense stands that inhibit regeneration of native species. Its seeds are wind-dispersed (PIER 2008l). This species occurs in dry to mesic habitats (Wagner *et al.* 1999, p. 389).

• *Toona ciliata* is a fast-growing tree with wind-dispersed seeds and an open, spreading crown that overtops and displaces native forest (Wagner *et al.* 1999, p. 920; Koala Native Plants 2005). This species occurs in disturbed mesic to wet habitats (Wagner *et al.* 1999, p. 168).

• *Urochloa mutica* is a fast growing, perennial grass native to Africa. It is considered an aggressive invasive weed of marshes and wetlands, forming dense monotypic stands that eliminate any open water by layering of its trailing stems (Smith 1985, p. 186; Erickson and Puttock 2006, p. 270). The species also forms monotypic stands in forest openings, displacing native plants. This species has been documented in riparian habitats, freshwater wetlands, swamps, and disturbed sites (*http://www.fs.fed.us/database/feis/plants/graminoid/uromut/all.html*).

• *Verbesina encelioides,* a tap-rooted, annual herb native to Mexico and the southwestern United States, is naturalized in Hawaii (Wagner *et al.* 1999, p. 372). This plant has a number of aggressive characteristics that allow it to outcompete native plants, including tolerance of a wide range of growing conditions, rapid growth, allelopathic effects on other plants, high seed production, and dispersal with high germination rates. In addition, it is poisonous to livestock (Shluker 2002, pp. 3–4, 7–8). *Verbesina* has become a widespread and aggressive weed on both Midway Atoll and Kure Atoll, where it interferes with seabird nesting and inhibits native plant growth (Shluker 2002, pp. 3–4, 8). This species has been documented at several localities on Oahu, and occurs in dry and disturbed habitats (Wagner *et al.* 1999, p. 168).

Habitat Destruction and Modification by Fire

Fire is a relatively new, human-exacerbated threat to native species and natural vegetation 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). 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 highly fire-prone areas of nonnative grasses and shrubs (D'Antonio and Vitousek 1992, p. 67). Although fires are infrequent in mountainous regions today, extensive fires have occurred in lowland mesic areas, leading to grass/fire cycles that convert woodland to grassland (D'Antonio and Vitousek 1992, p. 77).

Although Vogl (1969) (in Cuddihy and Stone 1990, p. 91) proposed that naturally occurring fires, primarily from lightning strikes, have been important in the development of the original Hawaiian flora, and that many Hawaiian plants might be fire adapted, 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. Smith and Tunison (in Cuddihy and Stone 1990, p. 91) 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 six of the plant species proposed for listing in this proposed rule, *Bidens amplectens, Cyanea calycina, Doryopteris takeuchii, Korthalsella degeneri, Pleomele forbesii, and Pteralyxia macrocarpa* (see Table 2). These six plant species are found in the coastal, lowland dry, lowland mesic, or dry cliff ecosystems. Fire can destroy dormant seeds of the six species as well as the 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 tips 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, within 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 also stated that ''burn events served to accelerate a decline process already in place, compressing into days a sequence which would ordinarily have taken decades'' (Takeuchi 1991, p. 4), and concluded that in addition to increasing the number of fires, the nonnative *Pennisetum* acted to suppress establishment of native plants after a

fire (Takeuchi 1991, p. 6). There have been several recent fires on Oahu that have impacted rare or endangered species, including areas being proposed as critical habitat in this proposed rule. Between 2004 and 2005, wildfires burned more than 360 ac (146 ha) in Honouliuli Preserve, home to more than 90 rare and endangered plants and animals, which is located along the windward side of the Waianae Mountains (The Nature Conservancy, in litt. 2005). In 2006, a fire at Kaena Point State Park burned 60 ac (24 ha), including portions of two proposed critical habitat units, and encroached on endangered plants in Makua Military Training Area. In 2007, there was a significant fire at Kaukonahua that crossed 12 gulches, eventually encompassing 5,655 ac (2,289 ha), and negatively impacted seven endangered plant species. Occurrences of three of the species were extirpated as a result of the fire. The Kaukonahua fire also provided pathways for nonnative ungulates (cattle, goats, and pigs) into previously undisturbed areas, and opened up previously densely vegetated areas for growth of the invasive grass *Panicum maximum* (guinea grass), which is also used as a food source by cattle and goats. An area infested by guinea grass burned, and the grass was observed to generate blades over 2 feet in length only 2 weeks after the fire (U.S. Army Garrison 2007, Appendices pp. 1–5). In 2009, there were two smaller fires that burned 200 ac (81 ha) at Manini Pali (Kaena Point State Park) and 3.8 ac (1.5 ha) at Makua Cave (at the mouth of Makua Valley). Both of these fires burned in currently designated critical habitat, although no individual plants were directly affected (U.S. Army Natural Resource Program 2009, Appendix 2, 17 pp.). These examples of recent fires illustrate that nonnative grass invasion leads to grass/fire cycles that convert native vegetation to grassland (D'Antonia and Vitousek 1992, p. 77).

Habitat Destruction and Modification by Hurricanes

Hurricanes adversely impact native Hawaiian terrestrial habitat, including each of the seven Oahu ecosystems 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). Canopy gaps allow for the establishment of nonnative plant species, which may be present as plants, or as seeds incapable of growing under shaded conditions. In addition, hurricanes adversely impact native Hawaiian stream habitat by defoliating and toppling vegetation, thus loosening the soil around the toppled vegetation. Loosened soil, loose vegetation, and other debris can be washed into streambeds (by hurricane-induced rain or subsequent rain storms), resulting in the scouring of the stream bottoms and channels, and catastrophic flooding (Polhemus 1993, 88 pp.). Because many Hawaiian plant and animal species, including the 23 species proposed for listing as endangered in this proposed rule, persist in low numbers and in restricted ranges, natural disasters, such as hurricanes, can be particularly devastating (Mitchell *et al.* 2005, p. 4–3).

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 7 ecosystems and the 20 plant species addressed in this proposed rule, as described in the ''*Specific Nonnative Plant Species Impacts*'' section above. In September 1992, Hurricane Iniki, a category 4 hurricane with maximum sustained wind speeds recorded at 140 mph (225 kph), passed directly over the island of Kauai and close to the island of Oahu, causing significant damage to areas along Oahu's southwestern coast (Barber's Point or Kalaeloa, through Kaena Point) (Blake *et al.* 2007, p. 20), where *Bidens amplectens* occurs. Biologists have documented hurricane damage (e.g., denuded foliage, toppled and uprooted trees and shrubs, landslides) to the habitat of six other plant species (*Cyrtandra kaulantha, C. sessilis, Melicope christophersenii, M. hiiakae, Platydesma cornuta* var. *cornuta,* and *Psychotria hexandra* ssp. *oahuensis*). Polhemus (1993, pp. 86–87) documented the extirpation of the scarlet Kauai damselfly (*Megalagrion vagabundum*), a species related to the blackline, crimson, and oceanic Hawaiian damselflies included in this listing proposal, from the entire Hanakapiai Stream system on the island of Kauai as a result of the impacts of Hurricane Iniki in 1992. Damage by future hurricanes could further decrease the remaining native-plant dominated habitat areas that support rare plants and animals in Oahu ecosystems (Bellingham *et al.* 2005, p. 681).

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

Landslides, rockfalls, 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 (630 to 760 mm) per year, yet the islands may receive up to 15 times this amount in some places, caused by orographic features (Wagner *et al.* 1999; adapted from Price (1983) and Carlquist (1980), pp. 38–39). During storms, rain may fall at 3 in (76 mm) per hour or more, and sometimes may reach nearly 40 in (1,016 mm) in 24 hours, causing destructive flash-flooding in streams and narrow gulches (Wagner *et al.* 1999; adapted from Price (1983) and Carlquist (1980)), pp. 38–39). Due to the steep topography of much of the area on Oahu where the species remain, erosion and disturbance caused by introduced ungulates exacerbate the potential for landslides, rockfalls, or flooding, which in turn threaten native plants and some of the damselfly species (see Table 2). 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 and rockfalls likely adversely impact nine of the species addressed in this proposed rule, including *Cyanea lanceolata, Cyrtandra kaulantha, C. sessilis, Doryopteris takeuchii, Melicope makahae, Platydesma cornuta* var. *decurrens, Psychotria hexandra* ssp. *oahuensis,* and the crimson and oceanic Hawaiian damselflies, as documented in observations by field botanists and surveyors (HBMP 2008). Monitoring data from the PEP program and the Hawaii Biodiversity and Mapping Program (HBMP) suggest that these nine 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). Since *C. kaulantha* is known from only

a few individuals in steep-walled stream valleys, one landslide could lead to near extirpation 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). Landslides can modify and destroy riparian and stream habitat by direct physical damage (e.g., rocks and debris falling in a stream, mechanical damage to riparian vegetation), and create disturbed areas leading to invasion by nonnative plants that outcompete the native plants, as well as damage or destroy plants used by the crimson and oceanic damselflies for perching. Field survey data presented by Bakutis (in litt. 2006c) and the PEP Program (2006, p. 51) suggest that flooding is a likely threat to two plant species included in this proposed listing, one population of *Psychotria hexandra* ssp. *oahuensis,* located in a narrow gulch, and one population of *Cyrtandra sessilis,* growing near a stream in a narrow valley. Intermittent flooding events likely occurred in the stream habitats of the blackline, crimson, and oceanic Hawaiian damselflies in the past, due to stochastic events such as storms and hurricanes. However, the current low numbers of individuals and populations, combined with their breeding, life history requirements in stream habitats, and reduced ranges of these three Hawaiian damselflies increase their vulunerability to the threat of flooding. The impact of flooding events may be increased by channelization of stream reaches, or degradation of riparian vegetation by feral ungulates. Naiads may be washed out of streams into the surrounding terrestrial habitat or washed downstream into portions of streams that are occupied by nonnative predatory fish. Adults perching on surrounding vegetation may be washed into flooded streams and drown.

The blackline, crimson, and oceanic Hawaiian damselflies may also be affected by temporary habitat loss associated with droughts, which are not uncommon in the Hawaiian Islands. Between 1860 and 2002, the island of Oahu was affected by 49 periods of drought (Giambelluca *et al.* 1991, pp. 3–4; Hawaii Commission on Water Resource Management 2009a and 2009b). These drought events often desiccate streams, irrigation ditches, and reservoirs; deplete groundwater supplies; and lead to forest and brush fires (Hawaii Commission on Water Resource Management 2009a and 2009b). Desiccation of streams, ditches, and reservoirs directly removes damselfly hunting and breeding habitat. Drought 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 of plants used by the three Hawaiian damselflies for perching and hunting for prey.

Habitat Destruction and Modification by Agriculture and Urban Development

Although we are unaware of any comprehensive, site-by-site assessment of wetland loss in Hawaii (Erikson and Puttock 2006, p. 40), Dahl (1990, p. 7) estimated that at least 12 percent of lowland to upper-elevation wetlands in Hawaii had been converted to non-wetland habitat by the 1980s. If only coastal plain (below 1,000 ft (305 m)) marshlands and wetlands are considered, it is estimated that 30 percent have been converted to agricultural and urban development (E. Kosaka, U.S. Fish and Wildlife Service, in litt. 1990). Historical records show these marshlands and wetlands provided habitat for many damselfly species, including the blackline, oceanic, and crimson Hawaiian damselflies (Polhemus 2007, pp. 233, 237–239; HBMP 2008).

Although filling of wetlands is regulated by permitting today, the loss of riparian or wetland habitats utilized by the blackline and crimson Hawaiian damselflies may still occur due to Oahu's population growth and development, with concurrent demands on limited developable land and water resources (Lester 2007). The State's Commission on Water Resource Management recognized the need for a water resource protection plan, which is currently under development (Commission on Water Resource Management 2010). In addition, marshes have been slowly filled and converted to meadow habitat as a result of sedimentation from increased storm water runoff from upslope development, the accumulation of uncontrolled growth of invasive vegetation, and blockage of downslope drainage (Wilson Okamoto & Associates, Inc. 1993, pp. 3–4, 3–5).

The threats posed by conversion of wetland and other aquatic habitat for agriculture and urban development are ongoing and are expected to continue into the future. Hawaii's population has increased almost 7 percent in the past 10 years, along with the associated increased demands on limited land and water resources (Hawaii Department of Business, Economic Development and Tourism 2010). These modified areas lack the aquatic habitat features that the blackline and crimson Hawaiian damselflies require for essential life-history needs, such as marshes, sidepools along streams, and slow sections of perennial streams, and no longer support populations of these two species. Agriculture and urban development have thus contributed to the present curtailment of the habitat of these two Hawaiian damselflies, and we have no indication that this threat is likely to be significantly ameliorated in the near future.

Habitat Destruction and Modification by Stream Diversion

Stream modifications began with the early Hawaiians who diverted water to irrigate taro (kalo, *Colocasia esculenta*). A taro planter's share of water was determined by the amount of labor contributed to the construction and maintenance of the ditch, and was not proportional to their acreage of flooded terraces. Water rights of others taking water from the main stream below the dam had to be respected, and no ditch was permitted to divert more than half the flow from a stream. Water was withdrawn according to a time schedule, from a few hours at a time day or night up to two or three days, and in times of drought, the ''water boss'' had the right to adjust the sharing of available water to meet exigencies (Handy and Handy 1972, pp. 58–59).

The advent of plantation sugarcane cultivation led to far more extensive stream diversions, with the first diversion built in 1856 on Kauai (Wilcox 1996, p. 54). The first diversion on Oahu, Oahu Ditch, was built in 1902 (Wilcox 1996, p. 65). These systems were designed to tap water at upper elevations (above 984 ft (300 m)) by means of a concrete weir in the stream (Wilcox 1996, p. 54). All, or most, of the low or average flow of the stream was, and often still is, diverted into fields or reservoirs, leaving many stream channels completely dry (Takasaki *et al.* 1969, pp. 27–28; Harris *et al.* 1993, p. 12; Wilcox 1996, p. 56).

By the 1930s, water diversions had been developed on all of the main Hawaiian Islands, and by 1978, the stream flow in more than half the 366 perennial streams in Hawaii had been altered in some manner (Brasher 2003, p. 1,055). Some stream diversion systems are extensive, such as the Waiahole Ditch on Oahu, built in the early 1900s, which diverts water from 37 streams within the ranges of the blackline, crimson, and oceanic damselflies, on the windward side of

Oahu to the dry plains on the leeward side of the island via a tunnel cut through the Koolau mountain range (Stearns and Vaksvik 1935, pp. 399–403; Tvedt and Oestigaard 2006, pp. 43–44). Historically, damselflies in the genus *Megalagrion* were a common component of Hawaiian streams and wetlands at elevations ranging from sea level to the summit of the Koolau Mountains on Oahu. This loss of stream habitat may have contributed to the extirpation of populations of the three damselflies from lower elevations in the Koolau range (Polhemus 2007, pp. 233–234, 238–239).

Habitat Destruction and Modification by Dewatering of Aquifers

In addition to the diversion of stream water and the resultant downstream dewatering, many streams on Oahu have experienced reduced or zero surface flow as a result of the dewatering of their source aquifers. Often these aquifers, which previously fed the streams, were tapped by tunneling or through the injudicious placement of wells (Gingerich and Oki 2000, p. 6; Stearns 1985, pp. 291–305). These groundwater sources were diverted for both domestic and agricultural use, and in some areas have completely depleted nearby stream and spring flows. For example, both the bore tunnels and the contour tunnel of the Waiahole Ditch system intersect perched aquifers (aquifers above the primary ground water table), which subsequently are drained to the elevation of the tunnels (Stearns and Vaksvik 1935, pp. 399–406). This has reduced stream habitat available to the blackline, crimson, and oceanic damselflies. Likewise, the boring of the Haiku tunnel on Oahu in 1940 caused a 25 percent reduction in the base flow of Kahaluu Stream, over 2.5 mi (4 km) away (Takasaki *et al.* 1969, pp. 31–32), and has impacted available habitat for the blackline and oceanic Hawaiian damselflies (HBMP 2008). Many of these aquifers were also the sources of springs that contributed flow to Oahu's windward streams; draining of these aquifers caused many of the springs to dry up, including some over 0.3 mi (0.5 km) away from the bore tunnels (Stearns and Vaksvik 1935, pp. 379–380).

Habitat Destruction and Modification by Vertical Wells

Surface flow of streams has also been affected by vertical wells drilled in pre-modern times, because the basal aquifer (lowest groundwater layer) and alluvial caprock (sediment-deposited harder rock layer) through which the lower sections of streams flow can be penetrated and hydraulically connected by wells (Gingerich and Oki 2000, p. 6; Stearns 1940, p. 88). This allows water in aquifers normally feeding the stream to be diverted elsewhere underground. Dewatering of the streams by tunneling and well placement near or in streams was a significant cause of habitat loss, and these effects continue today. Historically, for example, there was sufficient surface flow in Makaha and Nanakuli Streams on Oahu to support taro loi (artificial ponds for taro cultivation) in their lower reaches, but this flow disappeared subsequent to construction of vertical wells upstream (B. Devick, State of Hawaii, pers. comm. 1995). The inadvertent dewatering of streams through the penetration of their aquifers (which are normally separated from adjacent waterbearing layers by an impermeable layer) by tunneling or through placement of vertical wells, caused the loss of blackline, crimson, and oceanic Hawaiian damselflies habitat, as these species were historically known from these areas.

Habitat Destruction and Modification by Stream Channelization

Stream degradation has been particularly severe on the island of Oahu where, by 1978, 58 percent of the perennial streams and banks had been channelized (e.g., concrete lined, partially lined, or altered) to control flooding (Polhemus and Asquith 1996, p. 24; Brasher 2003, p. 1,055). These alterations have resulted in an overall 89 percent loss of the total stream length island-wide (Polhemus and Asquith 1996, p. 24; Parrish *et al.* 1984, p. 83). The channelization of streams creates artificial, wide-bottomed stream beds and often results in removal of riparian vegetation, which reduces shading, increases substrate homogeneity, increases temporal water velocity (increased water flow speed during times of higher precipitation including minor and major flooding), and causes higher water temperatures (Parrish *et al.* 1984, p. 83; Brasher 2003, p. 1,052). Tests conducted on native aquatic species showed that the higher water temperatures in channelized streams caused stress, and sometimes death (Parrish *et al.* 1984, p. 83). Natural streams meander and are lined with rocks, trees, and natural debris, and during times of flooding, jump their banks. Channelized streams are straightened and often lack natural obstructions, and during times of higher precipitation or flooding, facilitate a higher water flow velocity. Hawaiian damselflies are largely absent from channelized portions of streams (Polhemus and Asquith 1996, p. 24), which has likely contributed to a reduction in the historic range of Hawaiian damselfly species. In contrast, undisturbed Hawaiian stream systems exhibit a greater amount of riffle and pool habitat canopy closure, higher consistent flow velocity, and lower water temperatures that are characteristic of streams to which the Hawaiian damselflies, in general, are adapted (Brasher 2003, pp. 1,054–1,057).

Channelization of streams has not been restricted to lower stream reaches. For example, there is extensive channelization of Oahu's Kalihi Stream above 1,000 ft (300 m) elevation. Extensive stream channelization on Oahu has also contributed to the loss of habitat for the blackline, crimson, and oceanic Hawaiian damselflies (Englund 1999, p. 236; D. Polhemus, in litt. 2008).

Stream diversion, channelization, dewatering, and vertical wells represent serious and ongoing threats to the blackline, crimson, and oceanic Hawaiian damselflies for the following reasons: (1) They reduce the amount and distribution of stream habitat available to these species; (2) they reduce stream flow, leaving lower elevation stream segments completely dry except during storms, or leaving many streams completely dry year round, thus reducing or eliminating stream habitat; and (3) they indirectly lead to an increase in water temperature that results in physiological stress and to the loss of blackline, crimson, and oceanic Hawaiian damselfly naiads. The blackline, crimson, and oceanic Hawaiian damselflies are particularly vulnerable to extinction due to such changes (i.e., stream diversion, channelization, and dewatering), which is exacerbated by their range and habitat constrictions and declines in their population numbers.

Habitat Destruction and Modification by Climate Change

Climate change will be a particular challenge for biodiversity because the introduction and interaction of additional stressors may push species beyond their ability to survive (Lovejoy *et al.* 2005, pp. 325–326). The synergistic implications of climate change and habitat fragmentation are the most threatening facet of climate change for biodiversity (Lovejoy *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. We are not aware of climate change studies specifically related to the seven Oahu ecosystems described in this proposed rule, or the 23 species proposed for

listing that are associated with those 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 23 species occur (Pounds *et al.* 1999, p. 611–612; Still *et al.* 1999, p. 610; Benning *et al.* 2002, pp. 14,246 and 14,248). 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. These changes may decrease water availability and increase the consumptive demand on Oahu's natural streams and reservoirs by Oahu's residents (Giambelluca *et al.* 1991, p. v). The effects of increasing temperatures on the aquatic habitat of the three damselfly species are not specifically known, but likely include the loss of aquatic habitat from reduced stream flow, evaporation of standing water, and increased water temperature (Pounds *et al.* 1999, pp. 611–612; Still *et al.* 1999, p. 610; Benning *et al.* 2002, pp. 14,246 and 14,248).

Oki (2004, p. 4) has noted long-term evidence of decreased precipitation and stream flow on the Hawaiian Islands, based upon evidence collected by stream gauging stations. This long-term drying trend, coupled with existing ditch diversions and periodic El Niño-caused drying events, has created a pattern of severe and persistent stream dewatering events (D. Polhemus, in litt 2008, p. 26). 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 (Hawaii Climate Change Action Plan 1998, pp. 2–10).

The 23 species proposed for listing may be especially vulnerable to extinction due to anticipated environmental changes that may result from global climate change. 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), in addition to direct physiological stress caused by increased streamwater temperatures to which the native Hawaiian damselfly fauna are not adapted. The probability of a species going extinct as a result of these factors increases when its range is restricted, habitat decreases, and population numbers decline (Intergovernmental Panel on Climate Change 2007, p. 8). The 23 species have limited environmental tolerances, limited 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., Pounds *et al.* 1999, pp. 611–612; Still *et al.* 1999, p. 610; Benning *et al.* 2002, pp. 14,246 and 14,248). We believe changes in environmental conditions that may result from climate change may impact these 23 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 23 Oahu species addressed in this proposed rule are occurring throughout the entire range of each of the species. These threats include introduced ungulates, nonnative plants, fire, natural disasters, and climate change. In addition, the blackline, crimson, and oceanic Hawaiian damselflies are also threatened by agricultural and urban development, stream diversion, stream channelization, and stream dewatering.

The effects from ungulates are ongoing because ungulates currently occur in six of the seven ecosystems on which these species depend. The threat posed by introduced ungulates to the species proposed for listing that occur in these six ecosystems (see Table 2) is serious because they cause: (1) Trampling and grazing that directly impact the plant communities, which include the plant species proposed for listing, and impact plants in riparian areas used by the blackline, crimson, and oceanic damselflies for perching, reproduction, and hunting for prey; (2) increased soil disturbance, leading to mechanical damage to individuals of the plant species proposed for listing, and plants in riparian areas used by the damselflies for perching, reproduction, and hunting for prey; (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); and (4) increased watershed erosion and sedimentation, which affects aquatic habitats used by the three Hawaiian damselflies. Although plants used for perching by damselflies are not necessarily native plants, ungulate activity damages or removes all plants near the stream. Damselflies depend on plants near the stream for their daily activities, territory establishment, reproduction, and hunting prey. These threats are expected to continue or increase without ungulate control or eradication.

Nonnative plants represent a serious and ongoing threat to all 20 plant species being addressed in this proposed rule 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, the 20 plant species addressed here.

The threat from fire to six species in this proposed rule (*Bidens amplectens, Cyanea calycina, Doryopteris takeuchii, Korthalsella degeneri, Pleomele forbesii,* and *Pteralyxia macrocarpa;* see Table 2) is a serious and ongoing threat because fire damages and destroys native vegetation, including dormant seeds, seedlings, and juvenile and adult plants. Many nonnative invasive plants, particularly fire-tolerant grasses, can 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 omnipresent in ecosystems that have been invaded by nonnative, fire-prone grasses.

Natural disasters such as hurricanes represent a serious threat to 7 of the 20 plant species addressed in this proposed rule (*Bidens amplectens, Cyrtandra kaulantha, C. sessilis, Melicope christophersenii, M. hiiakae, Platydesma cornuta* var. *cornuta,* and *Psychotria hexandra* ssp. *oahuensis*), 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). The discussion under ''*Habitat Destruction and Modification by*

Nonnative Plants'' above provides additional information related to canopy gaps, light availability, and the establishment of nonnative plant species. In addition, hurricanes threaten the three Hawaiian damselfly species in this proposed rule because they alter and cause direct damage to streams (Polhemus 1993, pp. 86–87). These impacts can be particularly devastating to the seven plant species and three Hawaiian damselfly species addressed in this proposed rule because due to other threats, they now persist in low numbers or occur in restricted ranges, and are therefore less resilient to such disturbances. 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 occur at any time, although their occurrence is not predictable.

Landslides, rockfalls, and flooding adversely impact ten of the species being proposed for listing (*Cyanea lanceolata, Cyrtandra kaulantha, C. sessilis, Doryopteris takeuchii, Melicope makahae, Platydesma cornuta* var. *decurrens, Psychotria hexandra* ssp. *oahuensis,* and the blackline, crimson and oceanic Hawaiian damselflies) (see Table 2), by destabilizing substrates, damaging and destroying individual plants and damselflies, and altering hydrological patterns. These threats result in habitat destruction or modification, and changes to native plant and animal communities. Drought threatens all three damselfly species being proposed for listing by dessication of streams, ditches, and reservoirs, which eliminates damselfly hunting and breeding habitat. These threats are significant and have the potential to occur at any time, although their incidence is not predictable.

The threats caused by conversion of wetland and other aquatic habitat to agriculture and urban development are ongoing, expected to continue into the future, and affect each of the damselflies proposed for listing in this proposed rule. Twelve percent of the freshwater habitat in Hawaii has already been lost, and 30 percent of all coastal plain wetlands in Hawaii have been lost to agriculture and urban development (E. Kosaka, in litt. 1990). These modified areas no longer support populations of these Hawaiian damselflies. These threats are expected to continue in the future.

Stream diversion, channelization, and dewatering represent serious and ongoing threats to the blackline, crimson, and oceanic Hawaiian damselflies because they: (1) Reduce the amount and distribution of stream habitat; (2) reduce stream flow, which leaves lower elevation stream segments either completely dry year round or completely dry except during storms, which reduces or eliminates stream habitat; and (3) indirectly lead to an increase in water temperature by altering the normal hydrograph patterns, which leads to the loss of damselfly naiads due to direct physiological stress. The probability of species extinction increases when ranges are restricted, the quality and quantity of habitat decreases, and population numbers decline. Accordingly, the blackline, crimson, and oceanic Hawaiian damselflies are vulnerable to extinction due to such changes in their stream habitat.

The projected effects of global climate change and increasing temperatures on the 23 species addressed in this proposed rule 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, increased competition from nonnative species, and changes in disturbance regimes (e.g., fire, storms and hurricanes). Because the specific and cumulative effects of climate change on these 23 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

We are not aware of any threats to the 23 species addressed in this proposed rule that would be attributable to overutilization for commercial, recreational, scientific, or educational purposes.

C. Disease or Predation

Disease

We are not aware of any threats to the 23 species addressed in this proposed rule that would be attributable to disease.

Predation

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 established populations. For example, Hawaii lacks any native ants or conifers, has very few bird families, and has only a single native land mammal (Loope 1998, p. 748). Defenses against mammalian herbivory, such as thorns, prickles, and production of toxins, were not needed, and the evolutionary pressure for plants to produce or maintain them was lacking. Therefore, Hawaiian plants either lost or never developed these defenses (Carlquist 1980, p. 173). 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, ungulates threaten the following 18 of the 20 plant species in this proposal by trampling and eating individual plants (this information is also presented in Table 2): *Bidens amplectens* (feral pigs and goats), *Cyanea calycina* (feral pigs and goats), *C. lanceolata* (feral pigs), *C. purpurellifolia* (feral pigs), *Cyrtandra gracilis* (feral pigs), *C. kaulantha* (feral pigs), *C. sessilis* (feral pigs), *C. waiolani* (feral pigs), *Melicope christophersenii* (feral pigs), *M. hiiakae* (feral pigs), *M. makahae* (feral pigs and goats), *Platydesma cornuta* var. *cornuta* (feral pigs), *P. cornuta* var. *decurrens* (feral pigs and goats), *Pleomele forbesii* (feral pigs and goats), *Psychotria hexandra* spp. *oahuensis* (feral pigs), *Pteralyxia macrocarpa* (feral pigs and goats), *Tetraplasandra lydgatei* (feral pigs), and *Zanthoxylum oahuense* (feral pigs). Predation by feral pigs and goats is also a threat to the host plants (*Nestegis sandwicensis* and *Sapindus oahuensis*) of *Korthalsella degeneri.*

We have direct evidence of ungulate damage to some of these species, but for many, ungulate damage is presumed based on several studies conducted in Hawaii and elsewhere. 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 (Diong 1982, p. 160). 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 of the native plant species *Clermontia, Cibotium, Coprosma, Psychotria, Scaevola,* and *Hedyotis,* resulting in larger trees being killed over a few months of repeated feeding (Diong 1982, p. 144). A study in Texas conducted by Beach (1997, pp. 3–4) revealed that feral pigs spread disease and parasites, and that 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).

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). A study of goat predation on a native *Acacia koa* forest on the island of Hawaii has shown that grazing pressure by goats can cause the eventual extinction of *Acacia koa* because it is unable to reproduce (Spatz and Mueller-Dombois 1973, p. 876). If goats are maintained at constantly high numbers, mature trees will eventually die, including the root systems that support suckers and vegetative reproduction (Spatz and Mueller-Dombois 1973, p. 876). Another study at Puuwaawaa on the island of Hawaii demonstrated that prior to management actions in 1985, regeneration of endemic shrubs and trees in goat-grazed areas 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). Because goats occur in 6 of the 7 described ecosystems on Oahu, the results of the studies described above suggest that goats can also alter these ecosystems and directly damage or destroy native plants.

Rats

There are three species of introduced rats on the Hawaiian Islands. The Polynesian rat (*Rattus exulans*) and the black rat (*Rattus rattus*) are primarily found in the wild, in dry to wet habitats, while the Norway rat (*Rattus norvegicus*) is typically found in manmade habitats such as urban areas or agricultural fields (Tomich 1986, p. 41). Studies of Polynesian rat DNA suggest that they first appeared in the Hawaiian Islands along with emigrants from the Marquesas about 400 A.D., with a second cultural interaction around 1100 A.D. (Ziegler 2002, p. 315). The black rat and the Norway rat most likely arrived in the Hawaiian Islands more recently, as stowaways on ships, sometime in the 19th century (Atkinson and Atkinson 2000, p. 25).

Rats occur in all 7 of the Oahu ecosystems, and rat predation threatens 5 of the 20 plant species addressed in this proposed rule (*Cyanea calycina, C. lanceolata, Cyrtandra gracilis, Melicope hiiakae,* and *Psychotria hexandra* ssp. *oahuensis;* see Table 2). 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. They are known to have caused declines or even the total elimination of island plant species (Campbell and Atkinson 1999, as cited in Atkinson and Atkinson 2000, p. 24). On 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). Plants with fleshy fruits are particularly susceptible to rat predation, including several of the plant genera proposed for listing here, for example, the fruits of plants in the bellflower (e.g., *Cyanea* spp.) and African violet (e.g., *Cyrtandra* spp.) families (Cuddihy and Stone 1990, pp. 67–69). Research on rats in forests in New Zealand has demonstrated that, over time, rats may alter the species composition of forested areas (Cuddihy and Stone 1990, pp. 68–69).

Nonnative Fish

Predation by nonnative fish is a serious and ongoing threat to the blackline, crimson, and oceanic Hawaiian damselflies. Crimson and blackline Hawaiian damselfly naiads occur in standing or seep-fed pools and slow-flowing sections of streams, and oceanic Hawaiian damselfly naiads occur under stones or mats of moss and algae in streams, where they are each vulnerable to predation by nonnative fish. Information suggests that Hawaiian damselflies experience limited natural predation pressure from the five species of freshwater fish native to Hawaii—gobies (Gobiidae) and sleepers (Eleotridae) (Ego 1956, p. 24; Kido *et al.* 1993, pp. 43–44; Englund 1999, pp. 236–237). Hawaii's native fishes are benthic (bottom) feeders, and stream-dwelling Hawaiian damselfly species, including the blackline, crimson, and oceanic Hawaiian damselflies, avoid these areas in preference for shallow side channels, sidepools, and higher velocity riffles and seeps (Englund 1999, pp. 236–237). While fish predation has been an important factor in the evolution of behavior in damselfly naiads in continental systems (Johnson 1991, p. 8), it can only be speculated that Hawaii's stream-dwelling damselflies adapted behaviors to avoid the benthic feeding habits of native fish species. Additionally, some species of damselflies, including some native Hawaiian species, are found only in bodies of water without fish, and may have evolved in the absence of some fish species (Henrickson 1988, p. 179; McPeek 1990, p. 83).

Over 70 species of nonnative fish have been introduced into Hawaiian freshwater habitats (Devick 1991, p. 190; Englund 1999, p. 226; Englund and Eldredge 2001, p. 32; Brasher 2003, p. 1,054; Englund 2004, p. 27; Englund *et al.* 2007, p. 232), with at least 51 species now established (Freshwater Fishes of Hawaii 2008). The initial introduction of nonnative fish to Hawaii began with the release of food stock species by Asian immigrants at the turn of the 20th century; however, the impact of these first introductions on Hawaiian damselflies cannot be assessed because they predated the initial collection of damselflies in Hawaii (Perkins 1899, pp. 64–76). Between 1905 and 1922, fish were introduced for biological control of mosquitoes, including the mosquito fish (*Gambusia affinis*), sailfin molly (*Poecilia latipinna*), green swordtail (*Xiphophorus helleri*), moonfish (*Xiphophorus maculatus*), and guppy (*Poecilia reticulata*) (Van Dine 1907, p. 9; Englund 1999, p. 225; Brasher 2003, p. 1,054). By 1935, some Oahu damselflies were becoming less common, and these introduced fish were the suspected cause of their decline (Williams 1936, p. 313; Zimmerman 1948a, p. 341). From 1946 through 1961, several additional nonnative fish were introduced for the purpose of controlling nonnative aquatic plants and for recreational fishing (Brasher 2003, p. 1,054). During the 1980s, additional nonnative fish species were established in Oahu waters, including aggressive predators and habitat-altering species such as the channel catfish (*Ictalurus punctatus*), cichlids (e.g., *Tilapia* spp.), sailfin catfish (*Liposarcus multiradiatus*), top minnows (*Limia vittata*), and piranha (*Serrasalmus* sp.) (Devick 1991, pp. 189, 191–192; Brasher 2003, p. 1,054; Freshwater Fishes of Hawaii 2008). Englund (1999, p. 233) found several of these species to be abundant in nearly all lowland Oahu streams and water systems, although not all were as capable of colonizing higher elevation stream reaches as the introduced poeciliid species.

Geologic or manmade barriers (e.g., waterfalls, steep gradients, dry stream midreaches, or constructed diversions) appear to prevent access by nonnative fish species to stream areas above these barriers; however, there is still a chance

of facilitated fish movement. For example, in 2000, a maintenance worker introduced *Tilapia* spp. into ponds located on the grounds of Tripler Medical Army Hospital that were upslope from the remaining Oahu population of the orangeblack Hawaiian damselfly (*Megalagrion xanthomelas*) (R. Englund, Bishop Museum, in litt. 2000). The ponds were drained and the *Tilapia* spp. removed. The importance of their removal was underscored by the fact that a large storm caused the ponds to fill and overflow downslope into the stream supporting the damselflies soon after the *Tilapia* spp. were removed (Preston *et al.* 2007, p. 263).

Current literature indicates that the extirpation of Hawaiian damselflies from nearly all of their historical lowland habitat sites on Oahu is the result of predation by introduced nonnative fish (Moore and Gagne 1982, p. 4; Liebherr and Polhemus 1997, p. 502; Englund 1999, pp. 235–237; Brasher 2003, p. 1,055; Englund *et al.* 2007, p. 215; Polhemus 2007, pp. 238–239). The threats posed by continued introduction and establishment of nonnative fish in Hawaiian waters, and the possible movement of those nonnative species to new streams and other aquatic habitat, are ongoing and expected to continue into the future. This represents a serious threat to the survival of the blackline, crimson, and oceanic Hawaiian damselflies.

Bullfrogs and Toads

Currently there are three species of introduced aquatic amphibians on the Hawaiian Islands: the North American bullfrog (*Rana catesbeiana*), the cane toad (*Bufo marinus*), and the Japanese wrinkled frog (*Rana rugosa*). Native to the eastern United States and the Great Plains region (Moyle 1973, pp. 18–19; Bury and Whelan 1984, p. 1; Lever 2003, p. 203), the bullfrog was first introduced to Hawaii in 1899 (Bryan 1931, pp. 62–63) to help control insects, specifically the nonnative Japanese beetle (*Popillia japonica*), a significant pest of ornamental plants (Bryan 1931, p. 62). First released on the island of Hawaii, bullfrogs have demonstrated great success in establishing new populations on all the main islands (Bryan 1931, p. 63; Moyle 1973, p. 19; USGS 2008, p. 8). This species is flexible in both habitat and food requirements (McKeown 1996, pp. 24–27; Bury and Whelan 1984, pp. 3–7; Lever 2003, pp. 203–204), and can utilize any water source within its temperature range, 60 °F to 75 °F (16 °C to 24 °C) (DesertUSA 2008). In other areas outside its native range, the bullfrog's primary impact is the elimination of native frog species (Moyle 1973, p. 21). Englund *et al.* (2007, pp. 215, 219) found a strong correlation between the presence of bullfrogs and the absence of Hawaiian damselflies in their study of streams on all the main Hawaiian Islands. Bullfrogs are a threat to the blackline, crimson, and oceanic Hawaiian damselflies because they are omnivorous feeders that occur in the same habitat as the damselflies on Oahu (McKeown 1996, pp. 24–27; Bury and Whelan 1984, pp. 3–7; Lever 2003, pp. 203–204).

The effects of possible predation by the cane toad and the Japanese wrinkled frog on the blackline, crimson, and oceanic Hawaiian damselflies are unknown at this time, and we are not able to determine the magnitude or the significance of this potential threat.

Invertebrates

Predation by nonnative invertebrate pests adversely impacts 13 of the plant species (see Table 2) through mechanical damage, destruction of plant parts, parasitism, and mortality. Those introduced invertebrate pests with the greatest effect on these native plant species include at least 14 different species of slugs (Joe 2006, p. 10), the black twig borer (*Xylosandrus compactus*) (Davis 1970, pp. 38–39), and the two-spotted leafhopper (*Sophonia rufofascia*) (Fukada 1996, pp. 1–12; Hawaii Department of Agriculture 2006). The blackline, crimson, and oceanic Hawaiian damselflies are threatened by predation by ants (Borror *et al.* 1989, pp. 737–741).

Slugs

Predation by nonnative slugs is most likely a threat to individuals of the three species of *Cyanea* (*Cyanea calycina, C. lanceolata,* and *C. purpurellifolia*) and the four species of *Cyrtandra* (*Cyrtandra gracilis, C. kaulantha, C. sessilis,* and *C. waiolani*) (Joe 2006, p. 10) in this proposed rule. 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 cultivated individuals of *Cyanea* (L. Mehrhoff, U.S. Fish and Wildlife Service, in litt. 1995; U.S. Army Garrison 2005a, pp. 3–34, 3–51). In addition, slugs have damaged individuals of *Cyrtandra* and individuals of other species of *Cyanea* in the wild (Wood *et. al.* 2001, p. 3; Sailer and Kier 2002, p. 3; PEP 2007, p. 38; PEP 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 *Cyanea* sp. seedlings results in up to 80 percent seedling mortality (U.S. Army Garrison 2005a, p. 3–51). Although we do not have direct evidence of slug predation on the three species of *Cyanea* and four species of *Cyrtandra* addressed in this proposed rule, slugs are found in the ecosystems on Oahu in which these plants occur. It is therefore reasonable to assume these plant species would be exposed to similar impacts from slug predation.

Black Twig Borer

The black twig borer is known to infest a wide variety of common plant taxa, including native species of *Melicope* (Davis 1970, p. 39; Extension Entomology and UH–CTAHR Integrated Pest Management Program 2006, p. 1). This insect pest burrows into branches, introduces a pathogenic fungus as food for its larvae, and lays its eggs (Davis 1970, p. 39). Twigs, branches, and entire plants can be damaged or killed from an infestation (Extension Entomology and UH–CTAHR Integrated Pest Management Program 2006, p. 2). On the Hawaiian Islands, the black twig borer has many hosts, disperses easily, and is probably present at most elevations up to 2,500 ft (762 m) (Howarth 1985, pp. 152–153). The black twig borer is a likely threat to *Melicope christophersenii, M. hiiakae,* and *M. makahae.*

Two-Spotted Leafhopper

The effects of predation by the two-spotted leafhopper have been observed on three plant species included in this proposed rule, *Pleomele forbesii, Pteralyxia macrocarpa,* and *Zanthoxylum oahuense* (HBMP 2008). This nonnative insect damages the leaves it feeds on, typically causing chlorosis (yellowing due to disrupted chlorophyll production) to browning and death of foliage (Hawaii Department of Agriculture 2006). The damage to plants can result in the death of affected leaves or the whole plant, owing to the combined action of its feeding and oviposition behavior (Alyokhin *et al.* 2004, p. 1). In addition to the mechanical damage caused by the feeding process, the insect may introduce plant pathogens that lead to eventual plant death (Extension Entomology and UH–CTAHR Integrated Pest Management Program 2006, p. 2). The two-spotted leafhopper is a highly polyphagous insect (it feeds on many different types of food). Sixty-eight

percent of its recorded host plant species in Hawaii are fruit, vegetable and ornamental crops, and 22 percent are endemic plants, over half of which are rare and endangered (Alyokhin *et al.* 2004, p. 6). Its range is limited to below 4,000 ft (1,219 m) in elevation, unless there is a favorable microclimate. While there has been a dramatic reduction in the number of two-spotted leafhopper populations in the past few years, (possibly due to egg parasitism), this nonnative insect has not been eradicated and predation by this nonnative insect remains a threat (M. Fukada, Hawaii Department of Agriculture, pers. comm. 2007).

Ants

Ants are not a natural component of Hawaii's arthropod fauna, and native species evolved in the absence of predation pressure from ants. Ants can be particularly destructive predators because of their high densities, recruitment behavior, aggressiveness, and broad range of diet (Reimer 1993, pp. 14, 17–18). The threat of ant predation on the blackline, crimson, and oceanic Hawaiian damselflies is amplified by the fact that most ant species have winged reproductive adults (Borror *et al.* 1989, p. 738) and can quickly establish new colonies in additional suitable habitats (Staples and Cowie 2001, pp. 53–55). These attributes allow some ants to destroy otherwise geographically isolated populations of native arthropods (Nafus 1993, pp. 19, 22–23).

At least 47 species of ants are known to be established on the Hawaiian Islands (Hawaii Ants 2008, pp. 1–11), and at least four particularly aggressive species, the big-headed ant (*Pheidole megacephala*), the long-legged ant (also known as the yellow crazy ant, *Anoplolepis gracilipes*), *Solenopsis papuana* (NCN), and *Solenopsis geminata* (NCN) have severely impacted the native insect fauna, likely including native damselflies (Zimmerman 1948b, p. 173; Reimer 1993, pp. 11–13; Hawaii Ecosystems at Risk (HEAR) database 2007). Numerous other species of ants are recognized as threats to Hawaii's native invertebrates, and an unknown number of new species are established every few years (Staples and Cowie 2001, p. 53). Due to their preference for drier habitat sites, ants are less likely to occur in high densities in the aquatic habitat currently occupied by the blackline, crimson, and oceanic Hawaiian damselflies. However, some species of ants (e.g., the long-legged ant and *Solenopsis pauana)* have increased their range into this aquatic habitat. Furthermore, the presence of ants in nearly all of the lower elevation, historical habitat sites may preclude the future recolonization of these areas by damselflies, including the blackline, crimson, and oceanic Hawaiian damselflies. Damselfly naiads may be particularly susceptible to ant predation while perching on vegetation or rocks when they crawl out of the water or seek a terrestrial location for their metamorphosis into the adult stage (D. Polhemus, in litt. 2008). Newly emerged adult damselflies are also susceptible to predation until their wings have sufficiently hardened to permit flight (Polhemus and Asquith 1996, p. 4).

The long-legged ant appeared in Hawaii in 1952, and now occurs on Kauai, Oahu, Maui, and Hawaii (Reimer *et al.* 1990, p. 42). It inhabits low- to mid-elevation (less than 2,000 ft (600 m)) rocky areas of moderate rainfall (less than 100 in (250 cm) annually) (Reimer *et al.* 1990, p. 42). Direct observations indicate that Hawaiian arthropods are susceptible to predation by this species (Hardy 1979, p. 34; Gillespie and Reimer 1993, p. 21). *Solenopsis papuana* is the only abundant, aggressive ant that has invaded intact mesic and wet forest from sea level to 3,600 ft (1,100 m) on all the main Hawaiian Islands. Colonies reach dense populations, and ranges of this species are expanding on all islands (Reimer 1993, p. 14). The blackline, crimson, and oceanic Hawaiian damselflies' historical ranges were from sea level to over 2,400 ft (732 m) (Williams 1936, p. 318; Englund 1999, pp. 229–230), and they are currently found between 80 and 2,500 ft (24 and 762 m) in elevation (D. Polhemus, in litt. 2008; Polhemus and Asquith 1996, p. 77; HBMP 2008). It is likely, based on our knowledge of the expanding range of *Solenopsis papuana,* that it threatens all populations of these three Hawaiian damselflies. The rarity or disappearance of the native blackline, crimson, and oceanic damselfly species from historical observation sites is due to a variety of factors. While there is no documentation that conclusively ties the decrease in the blackline, crimson, and oceanic Hawaiian damselfly observations to the establishment of nonnative ants in the lowland mesic and lowland wet habitats, the presence of ants in these habitats, the knowledge that they prey on native invertebrates, and the decline of damselfly observations in some areas in these habitats suggest that nonnative ants play a role in the decline of some populations of these damselflies.

Summary of Disease or Predation

We are unaware of any information that indicates that disease is a threat to the 23 species. We consider predation and parasitism by nonnative animal species (pigs, goats, rats, fish, bullfrogs, and invertebrates) to pose an ongoing threat to 22 of the 23 species in this proposed rule throughout their ranges, and will continue to be so in the foreseeable future, for the following reasons:

(1) Observations and reports have documented that pigs and goats browse on and trample 18 of the 20 plant species, and browse on and trample the host plants of the other species (see Table 2); other studies demonstrate the negative impacts of ungulate browsing and trampling on native plant species of the Hawaiian islands (Spatz and Mueller-Dombois 1973, p. 874; Diong 1982, p. 160; Cuddihy and Stone 1990, p. 67).

(2) Nonnative invertebrates and rats cause mechanical damage to plants and destruction of plant parts (branches, fruits, seeds), affecting 14 of the 20 plant species in this proposed rule (see Table 2).

(3) The absence of Hawaiian damselflies (including the blackline, crimson, and oceanic Hawaiian damselflies), in streams and other aquatic habitat on the main Hawaiian Islands is strongly correlated with the presence of predatory nonnative fish as documented in numerous observations and reports (Englund 1999, p. 237; Englund 2004, p. 27; Englund *et al.* 2007, p. 215), which suggests nonnative predatory fishes eliminate native Hawaiian damselflies from these aquatic habitats. There are 70 introduced species of nonnative fishes, with over 51 species established in freshwater habitats on the Hawaiian Islands from sea level to over 3,800 ft (1,152 m) in elevation (Devick 1991, p. 190; Englund and Eldredge 2001, p. 32; Brasher 2003, p. 1,054; Englund 1999, p. 226; Englund 2004, p. 27; Englund *et al.* 2007, p. 232). Accordingly, predation by nonnative fishes is a serious and ongoing threat to the blackline, crimson, and oceanic Hawaiian damselflies (See Table 2).

(4) Damselfly naiads are vulnerable to predation by ants, and the ranges of the blackline, crimson, and oceanic Hawaiian damselflies overlap that of particularly aggressive, nonnative, predatory ant species that currently occur from sea level to 2,000 ft (610 m) in elevation on all of the main Hawaiian Islands. We therefore consider the three Hawaiian damselflies in this proposed rule to be threatened by predation by these nonnative ants.

(5) Englund *et al.* (2007, pp. 215, 219) found a strong correlation between the presence of nonnative bullfrogs and the absence of Hawaiian damselflies.

Bullfrogs are reported from riparian habitat on all the main Hawaiian Islands, except Kahoolawe and Niihau. Bullfrogs prey on almost anything that moves, including a wide variety of insects, invertebrates, and vertebrates (McKeown 1996, p. 24). The blackline, crimson, and oceanic Hawaiian damselflies also use riparian habitat, and are likely threatened by predation by bullfrogs.

D. The Inadequacy of Existing Regulatory Mechanisms

Inadequate Habitat Protection in Terrestrial Habitat

Currently, there are no existing Federal, State, or local laws, treaties, or regulations that specifically conserve or protect the 23 species proposed for listing, or adequately address the threats described in this proposed rule. Although 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. Nonnative ungulates pose a major ongoing threat to 19 of the 20 plant species and the 3 damselflies through destruction and degradation of terrestrial habitat, and through direct predation of 19 of the 20 plant species. The State of Hawaii provides game mammal (feral pigs and goats) hunting opportunities on 12 State-designated public hunting areas on the island of Oahu (H.A.R. sec. 13–123; DLNR 2009, pp. 25–30). 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 (H.A.R. sec. 13–123). Fifteen of the 20 plant species and all three damselfly species have populations in areas where terrestrial habitat may be managed for game enhancement, and where game populations are maintained at certain levels through public hunting (HBMP 2008; H.A.R. sec. 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 provide protection from game mammals, the current number and locations of fences are not adequate to prevent habitat destruction and degradation of the terrestrial habitat of 22 of the 23 species, and direct predation of 19 of the 20 plant species on Oahu.

Inadequate Habitat Protection in Aquatic Habitat

Existing regulations are inadequate to maintain stream flow year round for the different life stages of the three damselflies. In Hawaii, instream flow is regulated by establishing standards on a stream-by-stream basis. The standards currently in effect represent flow conditions in 1988, the year the administrative rules were adopted (State Water Code, Haw. Rev. Stat. 174C–71, and Administrative Rules of the State Water Code, Title 13, Chapter 169–44–49). The State of Hawaii considers all natural flowing surface water (streams, springs, and seeps) as State property (Haw. Rev. Stat. 174C), and the HDLNR has management responsibility for the aquatic organisms in these waters (Haw. Rev. Stat. Annotated, 1988, Title 12; 1992 Cumulative Supplement). Accordingly, damselfly populations in all natural flowing surface waters are under jurisdiction of the State of Hawaii, regardless of property ownership. This includes the blackline, crimson, and oceanic Hawaiian damselfly populations.

The State of Hawaii manages the use of surface and ground water resources through the Commission on Water Resource Management (Water Commission), as mandated by the 1987 State Water Code (State Water Code, Haw. Rev. Stat. 174, and Administrative Rules of the State Water Code, Title 13, Chapters 168 and 169). Because of the complexity of establishing Instream Flow Standards (IFS) for approximately 376 perennial streams, the Water Commission established interim IFS at status quo levels in 1987 (Commission on Water Resource Management 2009). In the Waiahole Ditch Combined Contested Hearing on Oahu (1997–2006), the Hawaii Supreme Court determined that status quo interim IFS were not adequate, and required the Water Commission to reassess the IFS for Waiahole Ditch and other streams Statewide (Case No. CCH–OA95–1). The Water Commission has been gathering information to fulfill this requirement since 2006, but no IFS recommendations have been made to date (Commission on Water Resource Management 2009).

In the Hawaii Stream Assessment Report (1990), prepared in coordination with the National Park Service, the State Water Commission identified high-quality rivers or streams, or portions of rivers or streams, that may be placed within a Wild and Scenic River system. This report recommended that streams meeting certain criteria be protected from further development. However, there is no mechanism within the State's Water Code to designate and set aside these streams, or to identify and protect stream habitat for Hawaiian damselflies.

The U.S. Army Corps of Engineers (COE) has regulatory jurisdiction under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) for activities that would result in a discharge of dredged or fill material into waters of the United States. However, in issuing these permits, the COE does not typically establish instream flow standards as a matter of policy (U.S. Army 1985, RGL 85–6).

Because there are currently no Federal, State, or local laws, treaties, or regulations that specifically or effectively conserve or protect the 23 species, or adequately address the threats from nonnative ungulates to the terrestrial habitat of 22 of the 23 species and from inadequate maintenance of instream flow for blackline, crimson, and oceanic Hawaiian damselfly habitat, these threats are ongoing and are expected to continue into the future.

Inadequate Protection From Introduction of Nonnative Species

The Hawaii Department of Agriculture (HDOA) is the lead State agency in protecting Hawaii's agricultural and horticultural industries, animal and public health, natural resources and environment from the introduction of nonnative, invasive species (HDLNR 2003, p. 3–10). While there are several State agencies (HDOA, HDLNR, Hawaii Department of Health) authorized to prevent the entry of pest species into the State, the existing regulations are inadequate for the reasons discussed in the sections below.

In 1995, a partnership, Coordinating Group on Alien Pest Species (CGAPS), 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 influence policy and funding decisions, 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 2009a; Haw. Rev. Stat. sec. 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* sp. (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 2009b).

Nonnative Aquatic Species

Existing State and Federal regulatory mechanisms are not adequately preventing the introduction of nonnative species to Hawaii via inter-State and international mechanisms, or intra-State movement of nonnative species between islands and watersheds in Hawaii. The importation of non-domestic animals, including aquatic species, is regulated by a permit system (H.A.R. sec. 4–71) managed through the Hawaii Department of Agriculture (HDOA). The HDOA's Board of Agriculture maintains lists of non-domestic animals that are prohibited from entry, animals with entry restrictions, or those that require a permit for import and possession. The HDOA requires a permit to import animals, and conditionally approves entry for individual possession, businesses (e.g., pet/resale trade, retail sales, food consumption), or institutions.

The Division of Aquatic Resources (DAR), within the State's HDLNR, manages the aquatic resources of the State (Hawaii DAR 2009), and is responsible for conserving, protecting, and enhancing the State's renewable resources of aquatic life and habitat (HDLNR 2003, p. 3–13). The release of live nonnative fish or other live nonnative aquatic life into any waters of the State is prohibited (Haw. Rev. Stat. sec. 187A–6.5). The DAR has the authority to seize, confiscate, or destroy as a public nuisance, any fish or other aquatic life found in any waters of the State and whose importation is prohibited or restricted pursuant to rules of the HDOA (Section 187A–2 (4 Haw. Rev. Stat. sec. 187A–6.5)). State and Federal regulations are in place to prevent the unauthorized entry of nonnative aquatic animals such as fish and amphibians into the State of Hawaii; however, their intentional or inadvertent introduction and movement between islands and between watersheds continues, although prohibited (HDOA 2003, pp. 2–12–2–14). However, there is insufficient regulatory capacity to adequately enforce such regulations or to provide for sufficient inspection services and monitoring, although this priority need is recognized (D. Cravalho, Hawaii Department of Agriculture, in litt. 2009).

Nonnative Invertebrate Species

Predation by nonnative invertebrate pests (e.g., slugs, black twig borer, two-spotted leafhopper) adversely impacts 13 of the plant species (see Table 2). In addition, naiads of the blackline, crimson, and oceanic Hawaiian damselflies are vulnerable to predation by ants. The decline of damselfly observations and the establishment of ants in lowland mesic and lowland wet habitats on Oahu suggest that the presence of nonnative ants in these habitats may preclude their occupancy by native damselflies (see Factor C. Disease or Predation). The prevention and control of introduction of pest species in Hawaii is the responsibility of Hawaii State government and Federal agencies, along with a few private organizations. Even though these agencies have regulations and some controls in place, 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 to 1970 (The Nature Conservancy of Hawaii 1992, p. 8).

Nonnative Plant Species

Nonnative plants destroy and modify habitat throughout the ranges of each of the 20 plant species being addressed in this proposed rule. As such, they represent a serious and ongoing threat to each of these plant 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,*'' under Factor A, above). The HDOA regulates the import of plants into the State from domestic origins under Hawaii State law Haw. Rev. Stat. Ch. 150A. While all plants require inspection upon entry into the State and must be ''apparently free'' of insects and diseases, not all plants require import permits. Parcels brought into the State by mail or cargo must be clearly labeled as ''plant materials'' or ''agricultural commodities,'' but it is unlikely that all of these parcels are inspected or monitored prior to delivery in Hawaii. Shipments of plant material into Hawaii must be accompanied by an invoice or packing manifest listing the contents and quantities of the items imported, but, again, it is unclear if all of these shipments are inspected or monitored prior to delivery (HDOA 2009).

There are only 12 plant crops that are regulated (H.A.R. 4–70) to some degree, including sugarcane and grasses, pineapple and other bromeliads, coffee, cruciferous vegetables, orchids, banana, passion fruit, pine, coconut, hosts of European corn borer, palms, and hosts of Caribbean fruit fly (HDLNR 2003, p. 3–11). The HDOA also maintains the State list of noxious weeds, and these plants are restricted from entry into the State except by permit from the HDOA's Plant Quarantine Branch. 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, which represents a threat to native flora for the reasons described above. In addition, government funding is inadequate to provide for sufficient inspection services and monitoring. One study concluded that the plant importation laws virtually ensure new invasive plants will be introduced via the nursery and ornamental trade, and that outreach efforts cannot keep up with the multitude of new invasive plants being distributed. The author states the only thing that wide-scale public outreach can do in this regard is to let the public know new invasive plants are still being sold, and they should ask for noninvasive or native plants instead (C. Martin, in litt. 2007, p. 9).

On the basis of the above information, existing regulatory mechanisms do not adequately protect the 23 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 of, or directly compete with one or more of the 23 species for food, space, and other necessary resources. Because current Federal, State, and local laws, treaties, and regulations are inadequate to prevent the introduction of nonnative species from outside the State of Hawaii, as well as the spread of nonnative species between islands and

watersheds, the impacts from these introduced threats are ongoing and are expected to continue in the foreseeable future.

Summary of Inadequacy of Existing Regulatory Mechanisms

We consider the threat from inadequate regulatory mechanisms to be ongoing, and we expect them 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 22 of the 23 species (Factor A), and predation of 19 of the 20 plant species (Factor C).

(2) The State Water Code does not provide for permanent or minimum IFS for the protection of aquatic ecosystems upon which the damselfly species proposed for listing depend, and does not contain a regulatory mechanism for identifying and protecting damselfly habitat (Factor A).

(3) Regulatory requirements under section 404 of the Clean Water Act are triggered only for activities that involve a discharge of dredged or fill material into waters of the United States. Section 404 of the Clean Water Act does not protect damselfly habitat or require implementation of instream flow requirements (Factor A).

(4) Existing State and Federal regulatory mechanisms are not preventing the introduction into Hawaii or the spread of nonnative species between islands and watersheds. Habitat-altering nonnative plant species (Factor A) and predation by nonnative animal species (Factor C) pose a major ongoing threat to the 23 species being addressed in this proposed rule.

Because existing regulatory mechanisms are inadequate to maintain habitat for the 23 species, and to prevent the spread of nonnative species, the inadequacy of existing regulatory mechanisms is considered to be a serious threat, both now and in the foreseeable future. Each of the 20 proposed plant species are threatened by habitat degradation and loss by nonnative plants (Factor A), and 19 of the 20 plants are threatened by nonnative animals (Factor A and Factor C). The three damselflies are threatened by habitat degradation and loss by stream channeling, conversion, and similar activities (Factor A), and by predation by nonnative fish and ants (Factor C). Therefore, all 23 species are threatened by the inadequacy of the regulatory mechanisms to address habitat degradation and loss, and nonnative species.

E. Other Natural or Manmade Factors Affecting Their Continued Existence

Other factors threatening some or all of the 23 species include small number of populations and small population sizes, human trampling as a result of hiking and other activities, loss of host plants, and lack of regeneration. Each threat is discussed in detail below, along with identification of which species are affected by these threats.

Small Number of Populations and Individuals

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 of 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). 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 discussions under Factors A and C).

Very small plant populations may experience reduced reproductive vigor due to ineffective pollination or inbreeding depression. This is particularly true for the functionally unisexual plants in this proposal like *Psychotria hexandra* ssp. *oahuensis,* in which staminate (male) and pistillate (female) flowers occur on separate individuals. Isolated individuals have difficulty achieving natural pollen exchange, which decreases the production of viable seed. Populations are also impacted by demographic stochasticity, through which populations are skewed toward either male or female individuals by chance.

The following nine plant species in this proposal are threatened by limited numbers (e.g., they total fewer than 50 individuals): *Cyanea purpurellifolia, Cyrtandra gracilis, C. kaulantha, C. waiolani, Melicope hiiakae, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Tetraplasandra lydgatei,* and *Zanthoxylum oahuense.* We consider these species threatened by small population size for the following reasons:

- *Cyanea purpurellifolia* is susceptible to reduced reproductive vigor due to the low number (18) of individuals remaining (DLNR 2005, p. 2). Although highly threatened by feral pigs, none of the individuals of this species are protected from ungulate predation (PEP 2007, p. 13).
- *Cyrtandra gracilis* is known only from a single occurrence, with six to eight individuals (NTBG Provenance Reports 2002, p. 1 and 2004, p. 1; PEP 2007a, p. 16).
- The only known wild populations of *Cyrtandra kaulantha* and *Psychotria hexandra* ssp. *oahuensis* are imminently threatened by flooding, landslides, and rock falls because of their locations in steep gulches (PEP 2006, p. 46, 51; PEP 2007a, p. 25).
- The last confirmed observation of *Cyrtandra waiolani* in the wild was approximately 40 years ago. The tentative identification of an individual in the wild as *C. waiolani* in 2005 cannot be confirmed without flowers or fruit. In addition, there are no tissues, propagules, or seeds in storage or propagation that have positively been identified (PEP 2007a, p. 19; A. Bakutis, in litt. 2008).
- *Melicope hiiakae* is susceptible to reduced reproductive vigor due to the lack of pollination and seed predation (NTBG Report 2007, p. 4; S. Perlman, in litt. 2007b).
- *Platydesma cornuta* var. *cornuta* individuals are widely scattered in the Koolau Mountains, and are susceptible to reduced reproductive vigor (HBMP 2008).
- The range of known occurrences of *Tetraplasandra lydgatei* has been reduced from 10 mi (16 km) to 2 mi (3 km) since 2005, and consists of 2 occurrences totaling 8 individuals (HBMP 2008). These individuals are showing a decline in health (A. Bakutis, in litt. 2008).
- Botanists have observed a steady decline in the numbers of individuals of *Zanthoxylum oahuense* over the last 9 years. This species is also susceptible to infestation by the two-spotted leafhopper (B. Garnett and J. Obata, in litt. 1999).

The blackline, crimson, and oceanic Hawaiian damselflies are threatened by limited numbers. Jordan *et al.* (2007, p. 247) conducted a genetic and comparative phylogeography analysis (study of historical processes responsible for genetic divergence within a species) of four Hawaiian *Megalagrion* species, including Pacific Hawaiian damselfly, an endangered species (June 24, 2010; 75 FR 35990), and the orangeblack Hawaiian damselfy, a candidate species (November 9, 2009; 74 FR 57804). This analysis demonstrated *Megalagrion* populations with low genetic diversity are at greater risk of decline and extinction than those with high genetic diversity. The authors found that low genetic diversity was observed in populations known to be bottlenecked or relictual (groups of animals or plants that exist as a remnant of a formerly widely distributed group), including Oahu and Maui populations of orangeblack Hawaiian damselfly and Pacific Hawaiian damselfly. Although this study did not include an analysis of the blackline, crimson, or oceanic Hawaiian damselflies, given that these five species have similar habitat, breeding, and life-history requirements, are related phylogenetically (same genus), and have low numbers of populations and individuals, it is reasonable to assume that populations of the blackline, crimson, and oceanic Hawaiian damselflies (each known from fewer than 20 populations) are also at great risk of decline and extinction.

Human Trampling and Hiking

Visitors on foot, horseback, and motorbikes may threaten *Cyanea calycina* directly due to trampling and other direct damage, and indirectly due to being a source of fire ignition in areas in the southern Waianae Mountains (TNC 1997, p. 10). Human impacts, such as trampling by hikers, has been documented as a threat to *C. calycina* in the northern Waianae Mountains, between Kaala and Puu Kalena summits (Wood, in litt. 2001). The largest known population of *Cyrtandra sessilis* is located along a popular hiking trail in the Koolau Mountains, and individuals climbing and hiking off the established trail to visit this occurrence could trample individual plants and contribute to soil compaction and erosion, preventing growth and establishment of seedlings (Bakutis 2008a). This type of activity has been observed with other native species (Wood, in litt. 2001; Hawaii Rare Plant Restoration Group 2007, p. 2). *Doryopteris takeuchii* occurs on the slopes of Diamond Head crater, a popular location for visitation by tour groups and hikers (HBMP 2008). Individuals leaving established trails will inadvertently trample plants and contribute to erosion of the steep hillsides where the plants are found. Field biologists have also observed trampling of vegetation near populations of *Melicope hiiakae* in the Koolau Mountains, suggesting that hikers could also be a threat to this species (Hawaii Rare Plant Restoration Group 2007, p. 2).

Loss of Host Plants and Loss of Regeneration

One species in this proposal, *Korthalsella degeneri,* is an obligate parasite on two native host plants, *Sapindus oahuensis* and *Nestegis sandwicensis,* which occur in the dry cliff ecosystem of the Waianae Mountains of Oahu. Introduced ungulates are a threat to the host plants, because of trampling and topsoil disruption, leading to erosion and the establishment and spread of nonnative plants (Factor A). Nonnative plants are a threat to *K. degeneri,* because they: (1) Degrade habitat and outcompete native plants; (2) can increase the intensity, extent, and frequency of fire, converting native shrubland and forest to land dominated by alien grasses; and (3) may cause the loss of the native host plants upon which *K. degeneri* depends (Factor A). In addition, the host plants are at risk of predation by feral ungulates, although ungulates are unlikely to be a direct threat to *K. degeneri* (Factor C), because of its parasitic characteristics.

Lack of regeneration or low levels of regeneration (i.e., reproduction) in the wild has been documented, and represents a threat to, *Melicope makahae* and *Pleomele forbesii* (HBMP 2008; J. Lau, in litt. 2001). There are four scattered populations of *Melicope makahae* in the Waianae Mountains. Two of these populations are at risk of extirpation because only one adult plant has been observed at one location and one adult plant and a single juvenile plant have been observed at the second location. There are 19 populations of *P. forbesii* in the Waianae Mountains, and only one population in the Koolau Mountains. The Koolau population is at risk of extirpation because of very few (if any) seedlings or juvenile plants have been observed, which indicates a lack of reproduction.

Summary of Other Natural or Manmade Factors Affecting Their Continued Existence

We consider the limited numbers of populations and few (less than 50) individuals to be serious and ongoing threat to at least nine plant species in this proposed rule 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 blackline, crimson, and oceanic Hawaiian damselflies 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, landslide) may result in extirpation of remaining populations and extinction of these species; and (4) species with few known locations, such as the blackline, crimson, and oceanic Hawaiian damselflies, are less resilient to threats that might otherwise have a relatively minor impact on widely distributed species. For example, the reduced availability of breeding habitat or an increase in predation of naiads that might be absorbed in 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.

In addition, the threat to *Cyanea calycina, Cyrtandra sessilis, Doryopteris takeuchii,* and *Melicope hiiakae* from human activities (e.g., trampling and hiking) is ongoing and expected to continue into the future because populations of all of these species are located near hiking trails or in areas used for recreational activities and the effect of these activities could lead to injury and death of individual plants.

The threat to *Korthalsella degeneri* from loss of its host plants is ongoing and expected to continue into the future because threats to its host plants from nonnative plants and feral ungulates are uncontrolled. Finally, we consider the threat to *Melicope makahae* and *Pleomele forbesii* from lack of regeneration to be ongoing and expected to continue into the future because, with their small numbers in the wild, any

competition from nonnative plants or habitat modification or predation by ungulates could lead to the extirpation of these species.

Proposed Listing Determination for 23 Species

We have carefully assessed the best scientific and commercial information available regarding threats to each of the 23 Oahu species. 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, primarily from feral ungulates and nonnative plants. Six of these species (*Bidens amplectens, Cyanea calycina, Doryopteris takeuchii, Korthalsella degeneri, Pleomele forbesii,* and *Pteralyxia macrocarpa*) are threatened by habitat destruction and modification from fire, and 14 species (*Bidens amplectens, Cyanea lanceolata, Cyrtandra kaulantha, C. sessilis, Doryopteris takeuchii, Melicope christophersenii, M. hiiakae, M. makahae, Platydesma cornuta* var. *cornuta, P. cornuta* var. *decurrens, Psychotria hexandra* ssp. *oahuensis,* and the blackline, crimson, and oceanic Hawaiian damselflies) are threatened by the destruction and modification of their habitats from hurricanes, landslides, rockfalls, and flooding. In addition, we are concerned about the effects of projected climate change, particularly rising temperatures, but recognize there is limited information on the exact nature of impacts from climate change (Factor A). There is a serious threat of widespread impacts of predation and herbivory on 19 of the 20 plant species (all plant species except *Doryopteris takeuchii*) by nonnative pigs, goats, rats, and invertebrates; and likely by predation on the three damselflies (blackline, crimson, and oceanic Hawaiian damselflies) by nonnative fish, bullfrogs and ants (Factor C). The inadequacy of existing regulatory mechanisms (e.g., inadequate protection of habitat and inadequate protection from the introduction of nonnative species) poses a current and ongoing threat to all 23 species (Factor D). There are current and ongoing threats to nine plant species (*Cyanea purpurellifolia, Cyrtandra gracilis, C. kaulantha, C. waiolani, Melicope hiiakae, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Tetraplasandra lydgatei,* and *Zanthoxylum oahuense*) and the three damselflies due to factors associated with small numbers of populations and individuals (Factor E); to *Melicope makahae* and *Pleomele forbesii* from the lack of regeneration (Factor E); to *Cyanea calycina, Cyrtandra sessilis, Doryopteris takeuchii,* and *Melicope hiiakae* from trampling (Factor E); and to *Korthalsella degeneri* from the loss of native host plants (Factor E) (see Table 2). In addition, the blackline, crimson, and oceanic Hawaiian damselflies are threatened by habitat degradation and loss due to agriculture and urban development, by stream diversion and channelization, and by dewatering of aquifers (Factor A). 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 an endangered species within the foreseeable future throughout all or a significant portion of its range.'' 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 listing the following 23 species as endangered in accordance with section 3(6) of the Act: the plants *Bidens amplectens, Cyanea calycina, Cyanea lanceolata, Cyanea purpurellifolia, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra sessilis, Cyrtandra waiolani, Doryopteris takeuchii, Korthalsella degeneri, Melicope christophersenii, Melicope hiiakae, Melicope makahae, Platydesma cornuta* var. *cornuta, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Tetraplasandra lydgatei, Zanthoxylum oahuense,* and the damselflies *Megalagrion leptodemas, Megalagrion nigrohamatum nigrolineatum,* and *Megalagrion oceanicum.*

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 23 endemic Oahu species proposed for listing in this proposed 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 unless it would not promote the conservation of the 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 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 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, pursuant to 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 23 species proposed for listing. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants.*

Although the 23 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 in the event they are listed. 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 **ADDRESSES**).

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 pursuant to 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 23 plants and animals proposed for listing as endangered species in this proposed 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, 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, 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 for wildlife and 17.61 for plants, 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 prohibitions include import or export, 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 threatened or endangered wildlife and plant species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22 and 17.62 for endangered wildlife and plants, respectively. With regard to endangered wildlife, a permit must be issued for the following purposes: for scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities. With regard to endangered plants, a permit must be issued for the following purposes: for scientific purposes or for the enhancement of propagation or survival. 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, Ecological Services, Eastside Federal Complex, 911 N.E. 11th Avenue, Portland, OR 97232–4181 (telephone 503–231–6158; 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 23 species, such as the introduction of competing, nonnative plants or animals to the State of Hawaii.

(3) The unauthorized release of biological control agents that attack any life stage of these 23 species.

(4) Unauthorized modification of the channel or water flow of any stream or removal or destruction of emergent aquatic vegetation in any body of water in which the blackline, crimson, and oceanic Hawaiian damselflies are known to occur.

(5) Unauthorized discharge of chemicals or fill material into any waters in which the blackline, crimson, and oceanic Hawaiian damselflies are known to occur.

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, Endangered Species Permits, Ecological Services, Eastside Federal Complex, 911 NE. 11th Avenue, Portland, OR 97232–4181 (telephone 503–231–6158; facsimile 503–231–6243).

If the 23 species are listed under the Act, the State of Hawaii's endangered species law (Haw. Rev. Stat. sec.195D 1–32) will be automatically invoked and provide supplemental protection, including prohibiting take of these species and encouraging 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 (Haw. Rev. Stat. sec. 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 will be reinforced and supplemented by protection under State law.

Proposed Taxonomic Name Changes for 10 Plant Species Since Listing

In 1982 we listed *Euphorbia skottsbergii* var. *kalaeloana* (47 FR 36846; August 24, 1982) as endangered following the taxonomy of Sherff (1936), although in 1959 Degener and Degener had moved this species to *Chamaesyce* (*Chamaesyce skottsbergii* var. *kalaeloana*). In both publications the range for this species included only the ''Ewa Plains of Oahu, Hawaii, in the vicinity of Barbers Point'' (also known as Kalaeloa). In 1990, Koutnik (p. 615) placed *Chamaesyce skottsbergii* var. *kalaeloana* in synonymy with *C. skottsbergii* var. *skottsbergii.* According to Koutnik, the range for *C. skottsbergii* var. *skottsbergii* included southwestern Oahu (the Ewa Plains) and northwestern Molokai. However, in 2005, based on genetic analysis, Morden and Gregoritza (2005, p. 969) found that the Oahu and Molokai populations of *C. skottsbergii* var. *skottsbergii* are genetically distinct and they supported the recognition of these two populations as distinct varieties. The authors suggested that the variety on Molokai should be recognized by the previously used variety name, *C. skottsbergii* var. *audens.* The scientific community and the Service currently accept Morden and Gregoritza's taxonomic clarification of *C. skottsbergii* var. *skottsbergii,* the range of which includes only southwestern Oahu.

At the time we listed *Alsinidendron obovatum* (56 FR 55770; October 29, 1991), *A. trinerve* (56 FR 55770; October 29, 1991), *Hedyotis coriacea* (57 FR 20772; May 15, 1992), *H. degeneri* (56 FR 55770; October 29, 1991), *H. parvula* (56 FR 55770; October 29, 1991), and *Lipochaeta tenuifolia* (56 FR 55770; October 29, 1991) as endangered, we followed the taxonomic treatment of Wagner *et al.* (1990, pp. 343, 501, 1,141–1,142, 1,148–1,150). Subsequently, Wagner *et al.* (2005, pp. 57–63) recognized and published new combinations (new genus and species names) for *Alsinidendron obovatum* (now *Schiedea obovata*) and *A. trinerve* (now *Schiedea trinervis*) based on phylogenetic analyses. These new combinations are currently accepted by the scientific community and by the Service. Terrell *et al.* (2005, pp. 832, 833) published new combinations for *Hedyotis coriacea* (now *Kadua coriacea*), *H. degeneri* (now *Kadua degeneri,* and includes *K. degeneri* var. *coprosmifolia* and *K. degeneri* var. *degeneri),* and placed *Hedyotis parvula* in synonymy with *Kadua parvula,* an earlier and validly published name. Wagner and Robinson (2001, p. 554) recognized and published new combinations for several Hawaiian species of *Lipochaeta,* including *Lipochaeta tenuifolia* (now *Melanthera tenuifolia*). At the time we listed *Phlegmariurus nutans* (59 FR 14482; March 28, 1994), we followed Ollgaard's *Index of the Lycopodiaceae* (1989, 135 pp.). Most recently, Palmer placed *Phlegmariurus nutans* in synonymy with *Huperzia nutans* (Palmer 2003, p. 257). We listed *Mariscus pennatiformis* (which included *M. pennatiformis* ssp. *bryanii* and *M. pennatiformis* ssp. *pennatiformis*) as endangered in 1994 (59 FR 56333) following the taxonomic treatment of Koyama (in Wagner *et al.* 1990, pp. 1,421–1,422). Since then, Strong and Wagner (1997, p. 39) and more recently, Wagner *et al.* (2003, pp. 52–53) moved all Hawaiian species of *Mariscus* to *Cyperus.* The accepted epithet for this species is *Cyperus pennatiformis* and includes *C. pennatiformis* var. *bryanii* and *C. pennatiformis* var. *pennatiformis.* The range of the species at the time of listing and now has not changed.

All of the aforementioned name changes are currently accepted by the scientific community, and we are proposing to accept them for purposes of the List of Endangered and Threatened Plants at 50 CFR 17.12 (see Table 3). These changes would also require us to make editorial revisions to a limited number of units and species descriptions in 50 CFR 17.99(a)(1) and (b) (Kauai), and 50 CFR 17.99(e)(1) and (f) (Maui), to adopt the taxonomic revisions.

TABLE 3—PROPOSED NAME CHANGES FOR 9 LISTED ENDANGERED HAWAIIAN PLANTS

Listing	Currently listed name	Proposed name or family change
56 FR 55770	*Alsinidendron obovatum*	*Schiedea obovata.*
56 FR 55770	*Alsinidendron trinerve*	*Schiedea trinervis.*
47 FR 36846	*Chamaesyce skottsbergii var. kalaeloana*	*Chamaesyce skottsbergii var. skottsbergii.*
57 FR 20772	*Hedyotis coriacea*	*Kadua coriacea.*
56 FR 55770	*Hedyotis degeneri*	*Kadua degeneri.*
56 FR 55770	*Hedyotis parvula*	*Kadua parvula.*
56 FR 55770	*Lipochaeta tenuifolia*	*Melanthera tenuifolia.*
59 FR 14482	*Phlegmariurus nutans*	*Huperzia nutans.*
59 FR 56333	*Mariscus pennatiformis*	*Cyperus pennatiformis.*

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 even 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 (areas on which are found the physical or biological features (PBFs) essential for the conservation 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 we should designate 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. Nor are we currently aware of any climate 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 designation for these species; however, we are specifically requesting 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, based on scientific data not now available to the Service, that are necessary for the recovery of the species. 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.

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. These areas 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 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 new information available to these planning efforts calls for a different outcome.

Prudency Determination for 24 Oahu 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 activity, and the identification of critical habitat can be expected to increase the degree of threat to the species; or (2) the designation of critical habitat would not be beneficial to the species.

As we have discussed under the Factor B analysis, there is currently no documentation that the 23 species proposed for listing are threatened by taking or other human activity. At the time we listed the plant *Achyranthes splendens* var. *rotundata* as endangered, we found that designation of critical habitat was not prudent because this plant was threatened by taking for lei-making, and the publication of critical habitat descriptions would make this plant more vulnerable (51 FR 10518; March 26, 1986). However, we have examined the best available information and found no information to indicate that this plant is currently threatened by overcollection for lei-making, or is otherwise used for commercial, recreational, scientific, or educational purposes. Moreover, we have no information to indicate that identification of critical habitat is expected to initiate such a threat to any of the species addressed in this proposed rule. Accordingly, this designation will provide information to individuals, local and State governments, and other entities engaged in activities or long-range planning in areas essential to the conservation of these species. Conservation of these species and their essential habitat will require habitat management, protection, and restoration, which will be facilitated by knowledge of habitat locations and the physical or biological features of the habitat. Other potential benefits include: (1) Triggering consultation under section 7 of the Act in new areas for actions with a Federal nexus where it would not otherwise occur; (2) focusing conservation activities on the most essential features and areas; and (3) preventing individuals from causing inadvertent harm to the species. Based on this information, we believe critical habitat would be beneficial, and have determined the designation of critical habitat is prudent for each of the species addressed in this proposed rule.

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 23 species proposed for listing in this proposed rule and the endangered plants *Achyranthes splendens* var. *rotundata* and *Chamaesyce skottsbergii* var. *skottsbergii* 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 sufficient instream flow for the blackline, crimson, and oceanic Hawaiian damselflies or specific host plants such as *Nestegis sandwicensis* and *Sapindus oahuensis* for *Korthalsella degeneri*. Therefore, because 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 25 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—*Achyranthes splendens* var. *rotundata, Bidens amplectens, Chamaesyce skottsbergii* var. *skottsbergii* (listed as *Euphorbia skottsbergii* var. *kaleloana*), *Cyanea calycina, Cyanea lanceolata, Cyanea purpurellifolia, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra sessilis, Cyrtandra waiolani, Doryopteris takeuchii, Korthalsella degeneri, Melicope christophersenii, Melicope hiiakae, Melicope makahae, Platydesma cornuta* var. *cornuta, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Tetraplasandra lydgatei,* and *Zanthoxylum oahuense;*

(2) Animals—*Megalagrion leptodemas, Megalagrion nigrohamatum nigrolineatum,* and *Megalagrion oceanicum.*

Critical Habitat Determinability

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)).

At the time we listed the plant *Chamaesyce skottsbergii* var. *skottsbergii* (see ''*Proposed Taxonomic Name Changes for 11 Plant Species Since Listing,*'' above) as endangered, we were unable to identify the biological needs of this species, and therefore were unable to identify areas essential for its conservation (critical habitat) (47 FR 36846, August 24, 1982). We reviewed the information available (since it was listed in 1982) pertaining to the biological needs of *Chamaesyce skottsbergii* var. *skottsbergii* and available information pertaining to the biological needs of the 23 species proposed for listing in this proposed rule and habitat characteristics where these species are located. This and other information represent the best scientific data available and led us to conclude that the designation of critical habitat is both prudent and determinable for these 25 species.

Proposed Critical Habitat Designation for 25 Oahu Species and Proposed Revision of Critical Habitat for 99 Oahu Plants

In this section, we discuss the proposed designation of critical habitat for 25 species. This includes 23 species identified in the above listing proposal and the 2 additional plant species (*Achyranthes splendens* var. *rotundata* and *Chamaesyce skottsbergii* var. *skottsbergii*) that were previously listed without designating critical habitat. This section also discusses the proposed revision of currently designated critical habitat for 99 Oahu plant species, based on new information. This information represents the best scientific and commercial information available.

Revision of Critical Habitat for 99 Oahu Plants

Under section 4(a)(3)(B)(ii) of the Act we may, as appropriate, revise a critical habitat designation. In 2003, we designated critical habitat for 99 Oahu plants on 55,040 ac (22,274 ha) in 303 units based on their known locations (68 FR 35950). Based on new information and scientific data available since 2003, we are proposing to revise critical habitat for these 99 plant species. Approximately 93 percent of the area being proposed as revised critical habitat in this proposed rule overlaps with the area designated in the 2003 final critical habitat rule. In some

areas, the footprint of the proposed revision is larger than the 2003 designation, to accommodate the expansion of species' ranges within the particular ecosystem in which they occur (e.g., expansion into unoccupied habitat). In other areas, we are proposing to reduce critical habitat, based on updated information on the historic ranges of certain species. The proposed revision correlates each species' physical or biological requirements with the characteristics of the ecosystems within which they occur (e.g., elevation, rainfall, species associations, etc.), and also includes areas unoccupied by the species but essential for their conservation. The proposed revision will 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 99 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 99 Listed Oahu Plants

It is our intent to discuss only those topics directly relevant to the proposed designation of critical habitat. For additional information on these 99 Oahu plants, refer to the final critical habitat rule for Oahu plants published in the **Federal Register** on June 17, 2003 (68 FR 35950).

Current Status of Plant Species in this Proposed Rule

Abutilon sandwicense (no common name (NCN)), a member of the mallow family (Malvaceae), is a perennial shrub endemic to the Waianae Mountains of Oahu (Bates 1999, pp. 873–875). At the time we designated critical habitat in 2003, the 30 known occurrences contained an estimated 253 to 263 individuals (68 FR 35951). This species currently occurs in the Waianae Mountains in the dry cliff and lowland mesic ecosystems in 17 to 19 occurrences totaling between 296 and 515 individuals (U.S. Army 2006; TNC 2007; HBMP 2008).

Achyranthes splendens var. *rotundata* (round-leaved chaff flower), a shrub in the amaranth family (Amaranthaceae), occurred historically on Oahu, Lanai, and Molokai. In 1986, at the time of listing, four occurrences containing approximately 400 individuals were known from southwestern and western Oahu in the coastal ecosystem at Barbers Point and Kaena Point, respectively (51 FR 10518, March 26, 1986; HBMP 2008). Subsequently, three additional occurrences were documented in Keawaula, Makaha, and Waianae Kai (HBMP 2008). Currently, this species is found in 8 occurrences in the coastal, lowland dry, and dry cliff ecosystems totaling approximately 700 individuals (Kane 2004, in litt.; Phillipson 2007, in litt.; HBMP 2008; Silbernagle 2010, in litt.).

Adenophorus periens (pendent kihi fern), a fern in the grammitis family (Grammitidaceae), occurs on the islands of Hawaii, Molokai, and Kauai, and was known historically from the Koolau Mountains of Oahu (Palmer 2003, p. 39). This species is an epiphyte found in the lowland wet and wet cliff ecosystems (TNC 2007; HBMP 2008). The last recorded observances of this fern on Oahu were in the early 1900s (HBMP 2008).

Alectryon macrococcus (mahoe), a member of the soapberry family (Sapindaceae), is a tree found on the islands of Kauai, Oahu, Molokai, and Maui (Wagner *et al.* 1999, p. 1,225). This species is known from two varieties, *A. macrococcus* var. *auwahiensis* (Maui) and *A. macrococcus* var. *macrococcus* (Kauai, Oahu, Molokai, and Maui). At the time we designated critical habitat in 2003, *A. macrococcus* var. *macrococcus* was known from 82 occurrences on Oahu containing approximately 300 individuals. Currently, *A. macrococcus* var. *macrococcus* is found in the Waianae Mountains in the dry cliff, lowland mesic, and montane wet ecosystems, in 15 occurrences totaling between 366 and 371 individuals (U.S. Army 2006; TNC 2007; HBMP 2008). This variety was historically known from the lowland mesic ecosystem in the Koolau Mountains.

Bonamia menziesii (NCN), a perennial vine in the morning glory family (Convolvulaceae), is found on Kauai, Oahu, Lanai, Maui, and Hawaii (Austin 1999, p. 550). At the time we designated critical habitat in 2003, this species was known from 18 occurrences on Oahu totaling fewer than 100 individuals. Currently, this species is declining on Oahu, with approximately 12 to 13 occurrences totaling fewer than 60 individuals, located in both the Waianae and Koolau Mountains, in the lowland dry, lowland mesic, and dry cliff ecosystems (U.S. Army 2006; TNC 2007; HBMP 2008).

Cenchrus agrimonioides (kamanomano), a perennial in the grass family (Poaceae), occurred historically on Oahu, Lanai, and Maui (O'Connor 1999, pp. 1,511–1,512). This species is known from two varieties, *C. agrimonioides* var. *agrimonioides* (Oahu, Lanai, and Maui) and *C. agrimonioides* var. *laysanensis* (Kure Atoll, Midway Atoll, and Laysan). *Cenchrus agrimonioides* var. *laysanensis* may be extinct. At the time we designated critical habitat in 2003, *C. agrimonioides* var. *agrimonioides* was known from 7 occurrences in the Waianae Mountains on Oahu, containing between 113 and 118 individuals. This variety is currently found on Oahu and Maui, and has been outplanted on Kahoolawe (USFWS 2007a; 2007b). On Oahu, 3 to 6 occurrences totaling approximately 300 wild individuals are found in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; USFWS 2007a; 2007b).

Centaurium sebaeoides (awiwi), an annual herb in the gentian family (Gentianaceae), is known from Kauai, Oahu, Molokai, Lanai, and west Maui (Wagner *et al.* 1999, p. 725). At the time we designated critical habitat in 2003, this species was known from 2 occurrences in the Waianae and Koolau Mountains, totaling between 60 and 80 individuals. Currently, *C. sebaeoides* occurs on Oahu in the coastal ecosystem at Kaena Point and Halona (Waianae and Koolau Mountains), in 2 occurrences totaling between 40 and 50 individuals (TNC 2007; HBMP 2008).

Chamaesyce celastroides var. *kaenana* (akoko), a shrub in the spurge family (Euphorbiaceae), is endemic to Oahu (Koutnik 1999, pp. 605–606). At the time we designated critical habitat in 2003, this species was known from 15 occurrences containing 569 individuals. Historically known from both the Waianae and Koolau Mountains, *C. celastroides* var. *kaenana* is currently found in the coastal, lowland dry, and lowland mesic ecosystems only in the Waianae Mountains, in 8 occurrences totaling more than 900 individuals (Makua Implementation Team 2003, pp. 16–32—16–38; U.S. Army 2006; TNC 2007; HBMP 2008).

Chamaesyce deppeana (akoko), a perennial subshrub in the spurge family (Euphorbiaceae), is endemic to the Koolau Mountains of Oahu (Koutnik 1999, p. 607). At the time we designated critical habitat in 2003, this species was known from one occurrence of approximately 50 individuals. Currently, the same occurrence in the wet cliff ecosystem in the Koolau Mountains is estimated to contain as many as 100 individuals (J. Lau, HBMP, pers. comm. 2006; S. Perlman, NTBG, pers. comm. 2006; TNC 2007).

Chamaesyce herbstii (akoko), a small tree in the spurge family (Euphorbiaceae), is endemic to the Waianae Mountains of Oahu (Koutnik

1999, p. 609). At the time we designated critical habitat in 2003, this species was known from 4 occurrences totaling between 162 and 164 individuals. *Chamaesyce herbstii* is declining in numbers, and is currently found in the lowland mesic and dry cliff ecosystems in the Waianae Mountains, in 2 occurrences totaling fewer than 60 individuals (Makua Implementation Team 2003, pp. 16–39—16–44; U.S. Army 2006; TNC 2007; HBMP 2008).

Chamaesyce kuwaleana (akoko), a shrub in the spurge family (Euphorbiaceae), is endemic to Oahu. At the time we designated critical habitat in 2003, this species was known from 5 occurrences containing approximately 2,000 individuals in the Waianae Mountains, with one individual known from Mokumanu, an islet off the windward coast of the Koolau Mountains (Koutnik 1999, p. 611). *Chamaesyce kuwaleana* was found historically in the coastal and dry cliff ecosystems, but is currently found only in the dry cliff ecosystem in the Waianae Mountains in 2 occurrences of approximately 1,200 individuals (TNC 2007; HBMP 2008).

Chamaesyce rockii (akoko), a shrub or small tree in the spurge family (Euphorbiaceae), is endemic to the Koolau Mountains of Oahu (Koutnik 1999, p. 614). At the time we designated critical habitat in 2003, this species was known from 20 occurrences containing between 641 and 733 individuals. Currently, this species is found in 6 occurrences in the lowland wet and wet cliff ecosystems in the Koolau Mountains, totaling between 576 and 710 individuals (U.S. Army 2006; TNC 2007; HBMP 2008).

Chamaesyce skottsbergii var. *skottsbergii* (formerly *Chamaesyce skottsbergii* var. *kalaeloana*) (Ewa Plains akoko), a small shrub in the spurge family (Euphorbiaceae), is endemic to Oahu. Historically, this species was only known from the Ewa Plains on southwestern Oahu in the vicinity of Barbers Point (also known as Kalaeloa). The precise natural range of this taxon was unknown, but probably did not go beyond the coralline plains of southwestern Oahu (47 FR 36846, August 24, 1982). In 1982, at the time of listing, this species was known from 4 occurrences containing approximately 1,000 to 1,500 individuals (Char and Balakrishnan 1979, p. 67; HBMP 2008). Currently, this species is found in 2 occurrences in coral outcrops in the lowland dry ecosystem on the Ewa Plain in southwestern Oahu, totaling approximately 1,524 individuals (Guinther and Withrow 2008, pp. 6, 9–10, Whistler 2008, pp. 7–9).

Colubrina oppositifolia (kauila), a tree in the buckthorn family (Rhamnaceae), is known from Oahu, Maui, and the island of Hawaii (Wagner *et al.* 1999, p. 1,094). At the time we designated critical habitat in 2003, this species was found in 5 occurrences in the Waianae Mountains containing 61 individuals. Currently, on Oahu, *Colubrina oppositifolia* is found in the lowland mesic ecosystem in the Waianae Mountains, in 4 occurrences totaling approximately 50 individuals (U.S. Army 2006; TNC 2007; HBMP 2008).

Ctenitis squamigera (pauoa), a medium to large-sized fern in the spleenwort family (Aspleniaceae), is found on all the major islands except Hawaii. It is possibly now extinct on Kauai (Palmer 2003, pp. 100–102). At the time we designated critical habitat in 2003, there were 8 known occurrences with more than 80 individuals in the Waianae and Koolau Mountains of Oahu. Currently there are 4 occurrences totaling approximately 100 individuals, in the lowland mesic ecosystem in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyanea acuminata (haha), a shrub in the bellflower family (Campanulaceae), is endemic to the Koolau Mountains of Oahu (Lammers 1999, p. 444). At the time we designated critical habitat in 2003, there were fewer than 200 individuals in 20 occurrences. Currently, there are 15 occurrences totaling between 149 and 175 individuals in the lowland mesic, lowland wet, montane wet, and wet cliff ecosystems in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyanea crispa (NCN), a shrub in the bellflower family (Campanulaceae), is endemic to the Koolau Mountains of Oahu (Lammers 1999, p. 481–482; Wagner and Herbst 1999, p. 1,870). At the time we designated critical habitat in 2003, there were 11 occurrences containing a total of 56 individuals. Currently, this species is found in 7 occurrences, totaling 56 individuals, in the lowland mesic, lowland wet, and wet cliff ecosystems in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyanea grimesiana ssp. *grimesiana* (haha), a shrub in the bellflower family (Campanulaceae), is found on Molokai, Lanai, Maui, and Oahu (Lammers 1999, pp. 451–452). At the time we designated critical habitat in 2003, there were seven occurrences totaling nine individuals in the Waianae and Koolau Mountains. Currently, there are five to six individuals in four occurrences in the lowland mesic and lowland wet ecosystems in the Waianae and Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyanea grimesiana ssp. *obatae* (haha), a shrub in the bellflower family (Campanulaceae), is endemic to the Waianae Mountains of Oahu (Lammers 1999, pp. 451–452). At the time we designated critical habitat in 2003, there were 8 occurrences containing 16 individuals. Currently, there are 8 occurrences totaling 41 individuals in the dry cliff, lowland mesic, and lowland wet ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyanea humboldtiana (haha), a shrub in the bellflower family (Campanulaceae), is endemic to the Koolau Mountains of Oahu (Lammers 1999, p. 483; Wagner and Herbst 1999, p. 1,870). At the time we designated critical habitat in 2003, there were 9 occurrences totaling between 133 and 239 individuals. Currently, this species occurs in 9 occurrences totaling between 160 to 260 individuals in the lowland wet and wet cliff ecosystems in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyanea koolauensis (haha), a shrub in the bellflower family (Campanulaceae), is endemic to the Koolau Mountains of Oahu (Lammers 1999, p. 481; Wagner and Herbst 1999, p. 1,870). At the time we designated critical habitat in 2003, there were 42 occurrences with fewer than 80 individuals. Currently, this species is found in 15 occurrences with approximately 100 individuals in the lowland wet ecosystem in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyanea longiflora (haha), a shrub in the bellflower family (Campanulaceae), occurs in the Waianae Mountains, and was historically known from the Koolau Mountains of Oahu (Lammers 1999, p. 484; Wagner and Herbst 1999, p. 1,870). At the time we designated critical habitat in 2003, there were 4 occurrences of fewer than 220 individuals in the Waianae Mountains. Currently, there are 4 occurrences totaling fewer than 170 individuals in the lowland mesic ecosystem in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyanea pinnatifida (haha), a shrub in the bellflower family (Campanulaceae), is endemic to the Waianae Mountains of Oahu (Lammers 1999, p. 459). The last known wild individual died in 2001, although the species remains in cultivation, and 70 individuals have been outplanted within historical range in the lowland mesic ecosystem in the Waianae Mountains (TNC 2006h, p. 6).

Cyanea st.-johnii (haha), a shrub in the bellflower family (Campanulaceae), is endemic to the Koolau Mountains of Oahu (Lammers 1999, p. 484; Wagner and Herbst 1999, p. 1,871). At the time we designated critical habitat in 2003, there were 7 occurrences containing 57 individuals. Currently, 6 occurrences are found in the lowland wet and wet cliff ecosystems, with approximately 70 individuals, in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyanea superba (NCN), a palm-like tree in the bellflower family (Campanulaceae), is endemic to the lowland mesic ecosystem of the Waianae Mountains of Oahu (Lammers 1999, p. 465). This species is known from two subspecies, *Cyanea superba* ssp. *regina* (southern Koolau Mountains) and *Cyanea superba* ssp. *superba* (northern Waianae Mountains). The last known wild individual of *Cyanea superba* ssp. *superba* died in 2002; however, propagules are in cultivation and more than 400 individuals have been outplanted over the past 10 years in the Waianae Mountains. Currently a total of at least 200 mature outplanted individuals of *Cyanea superba* ssp. *superba* survive (TNC 2007; HBMP 2008). *Cyanea superba* ssp. *regina* has not been observed since the 1930's (Lammers 1999, p. 465).

Cyanea truncata (haha), a shrub in the bellflower family (Campanulaceae), is endemic to the Koolau Mountains of Oahu, in the lowland mesic, lowland wet, and wet cliff ecosystems (Lammers 1999, p. 466). At the time we designated critical habitat in 2003, there were only two known individuals in the lowland mesic ecosystem in the Koolau Mountains. Currently, these individuals survive along with outplanted occurrences totaling 14 individuals (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyperus pennatiformis (formerly *Mariscus pennatiformis*) (NCN), a perennial in the sedge family (Cyperaceae), was found on Kauai, Oahu, east Maui, the island of Hawaii, and Laysan Island in the Northwestern Hawaiian Islands. This species is known from two varieties, *C. pennatiformis* var. *bryanii* (Laysan Island) and *C. pennatiformis* var. *pennatiformis* (Kauai, Oahu, east Maui, and Hawaii Island) (Koyama 1999, pp. 1,421–1,422; Wagner and Herbst 1999, p. 1,900). The last known individual of *C. pennatiformis* var. *pennatiformis* on Oahu was observed in the 1930s, in the lowland mesic ecosystem in the Waianae Mountains (TNC 2007; HBMP 2008).

Cyperus trachysanthos (puukaa), a perennial in the sedge family (Cyperaceae), was known from Niihau, Kauai, Oahu, Molokai, and Lanai; and is currently extant on Niihau, Kauai, and Oahu (Koyama 1999, p. 1,399). At the time we designated critical habitat in 2003, there were 6 occurrences totaling 40 individuals on Oahu. Currently, there are 3 occurrences totaling approximately 400 individuals in seasonal wetlands in the coastal and lowland dry ecosystems in both the Waianae and Koolau Mountains (TNC 2007; HBMP 2008).

Cyrtandra dentata (haiwale), a shrub in the African violet family (Gesneriaceae), is endemic to Oahu, and is known from both the Waianae and Koolau Mountains (Wagner *et al.* 1999, p. 753). At the time we designated critical habitat in 2003, there were 11 known occurrences totaling 136 individuals. Currently, due to an increase in survey efforts over the last 6 years in potentially suitable habitat for this species, there are 6 occurrences totaling approximately 1,640 individuals in the lowland mesic and lowland wet ecosystems of both mountain ranges, and in the dry cliff ecosystem in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyrtandra polyantha (haiwale), a shrub in the African violet family (Gesneriaceae), is endemic to the Koolau Mountains of Oahu (Wagner *et al.* 1999, pp. 774–775). At the time we designated critical habitat in 2003, there was one known occurrence of three individuals. Currently, there are two occurrences of seven to nine individuals in the lowland mesic and lowland wet ecosystems in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyrtandra subumbellata (haiwale), a shrub in the African violet family (Gesneriaceae), is endemic to the Koolau Mountains of Oahu (Wagner *et al.* 1999, p. 779). At the time we designated critical habitat in 2003, there were 5 occurrences totaling 12 individuals. Currently, there are 3 occurrences totaling a little more than 100 individuals in the lowland wet and wet cliff ecosystems in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Cyrtandra viridiflora (haiwale), a small shrub in the African violet family (Gesneriaceae), is endemic to the Koolau Mountains of Oahu (Wagner *et al.* 1999, p. 780). At the time we designated critical habitat in 2003, there were 23 occurrences totaling 52 individuals. Currently, there are 5 occurrences totaling 75 individuals in the lowland wet and wet cliff ecosystems in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Delissea subcordata (oha), a shrub in the bellflower family (Campanulaceae), is found in the Waianae and Koolau Mountains of Oahu (Lammers 1999, p. 471). At the time we designated critical habitat in 2003, this species was known from 21 occurrences containing fewer than 70 individuals, in the Waianae Mountains. Currently, there are 9 occurrences totaling between 28 and 40 individuals in the lowland mesic ecosystem in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Diellia erecta (asplenium-leaved diellia), a fern in the spleenwort family (Aspleniaceae), occurs on Oahu, Molokai, Maui, and Hawaii (Palmer 2003, p. 117). At the time we designated critical habitat in 2003, this species was known from Kauai, Molokai, Maui, and Hawaii, but there was only 1 known occurrence of 20 individuals on Oahu. This occurrence on Oahu persists, with approximately 20 to 30 individuals, in the lowland mesic ecosystem of the Koolau Mountains (TNC 2007; HBMP 2008).

Diellia falcata (NCN), a fern in the spleenwort family (Aspleniaceae), is endemic to the Waianae and Koolau Mountains of Oahu (Palmer 2003, p. 119). At the time we designated critical habitat in 2003, this species was found in 30 occurrences totaling fewer than 6,000 individuals in the Waianae Mountains. Currently, *D. falcata* is found in 13 occurrences (totaling between 4,000 and 7,000 individuals) in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Diellia unisora (NCN), a fern in the spleenwort family (Aspleniaceae), is endemic to the Waianae Mountains of Oahu (Palmer 2003, p. 122). At the time we designated critical habitat in 2003, this species was known from 4 occurrences containing fewer than 800 individuals. Currently, *D. unisora* is known from 4 occurrences totaling approximately 700 individuals in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Diplazium molokaiense (NCN), a fern in the spleenwort family (Aspleniaceae), was known from all the major islands except Hawaii (Wagner and Wagner 1992, p. 33; Palmer 2003, p. 125). At the time we designated critical habitat in 2003, this species had not been documented on Oahu since 1945, and was present only at one site on east Maui. On Oahu, this species was known from the lowland mesic and lowland

wet ecosystems in the Waianae Mountains (Wood 2006, p. 32; TNC 2007; HBMP 2008).

Dubautia herbstobatae (naenae), a shrub in the sunflower family (Asteraceae), is endemic to the Waianae Mountains of Oahu (Carr 1999, pp. 297–298). At the time we designated critical habitat in 2003, this species was known from 12 occurrences totaling fewer than 100 individuals. Currently, *D. herbstobatae* is found in 2 occurrences totaling over 2,000 individuals in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008). The increase in the number of individuals is possibly due to the recent removal of feral goats from surrounding areas through fencing and eradication efforts (Makua Implementation Team 2003, pp. 2–98—2–104).

Eragrostis fosbergii (Fosberg's lovegrass), a perennial in the grass family (Poaceae), is endemic to the Waianae Mountains of Oahu (O'Connor 1999, pp. 1,541–1,542). At the time we designated critical habitat in 2003, there were only four occurrences known, each of a single individual. Currently, these individuals remain, with no reports of regeneration, in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (TNC 2007; HBMP 2008).

Eugenia koolauensis (nioi), a small tree or shrub in the myrtle family (Myrtaceae), is known from Oahu and Molokai (Wagner *et al.* 1999, p. 960). At the time we designated critical habitat in 2003, there were 12 occurrences totaling fewer than 70 individuals in the Waianae and Koolau Mountains of Oahu. Currently, this species is found in the lowland mesic ecosystem in the Waianae Mountains (2 occurrences) and in the Koolau Mountains (11 occurrences), totaling approximately 500 mature individuals (U.S. Army 2006; TNC 2007; HBMP 2008). These individuals are currently threatened by *Puccinia psidii,* a rust fungus that infests plants in the Myrtaceae family (Loope and LaRosa 2007, p. 1).

Euphorbia haeleeleana (akoko), a small tree in the spurge family (Euphorbiaceae), is known from Kauai and Oahu (Koutnik and Huft 1999, p. 619). At the time we designated critical habitat in 2003, this species was known from 8 occurrences of approximately 134 individuals, in the Waianae Mountains of Oahu. Currently, there are 6 occurrences totaling 65 individuals in the lowland dry and lowland mesic ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Flueggea neowawraea (mehamehame), a tree in the spurge family, (Euphorbiaceae) is known from Oahu, Kauai, Maui, and the island of Hawaii, and was possibly historically found on Molokai (Wagner *et al.* 1999, pp. 620–621). At the time we designated critical habitat in 2003, this species was found in the Waianae Mountains of Oahu, in 23 occurrences with a total of 31 individuals. Currently, there are 18 occurrences totaling 36 individuals in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Gardenia mannii (nanu), a tree in the coffee family (Rubiaceae), is endemic to Oahu (Wagner *et al.* 1999, p. 1,133). At the time we designated critical habitat in 2003, there were 49 occurrences in both the Waianae and Koolau Mountains, totaling between 69 and 80 individuals. Currently, 18 occurrences are known (totaling 108 to 110 individuals) in the lowland mesic and lowland wet ecosystems in both mountain ranges (TNC 2007; HBMP 2008).

Gouania meyenii (NCN), a shrub in the buckthorn family (Rhamnaceae), is known from Oahu and Kauai (Wagner *et al.* 1999, pp. 1,095–1,096; NTBG Provenance Report, in litt. 1994, 2 pp.). On Oahu, this species was historically found in the lowland dry and lowland mesic ecosystems of the Waianae Mountains, and the lowland dry ecosystem at Diamond Head (HBMP 2008). At the time we designated critical habitat in 2003, the 4 known occurrences in the Waianae Mountains contained 63 individuals. Currently, this species is found in 3 occurrences totaling fewer than 70 individuals in the dry cliff ecosystem in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Gouania vitifolia (NCN), a climbing shrub in the buckthorn family (Rhamnaceae), is known from Oahu, west Maui, and the island of Hawaii (Wagner *et al.* 1999, p. 1,097). This species is endemic to the Waianae Mountains (Wagner *et al.* 1999, p. 1,097), and was thought to be extirpated from Oahu in the 1990s. However, at the time we designated critical habitat in 2003, *G. vitifolia* was found in 2 occurrences totaling 44 individuals in the Waianae Mountains. Currently, there are 2 occurrences totaling 58 to 64 individuals, within the lowland dry, lowland wet, and dry cliff ecosystems in the Waianae Mountains (HBMP 2008). This species was also historically known from the lowland mesic ecosystem in the Waianae Mountains (HBMP 2008).

Hesperomannia arborescens (NCN), a small tree in the sunflower family (Asteraceae), is found on Maui, Molokai, and the Koolau Mountains of Oahu, and was historically found on Lanai (Wagner *et al.* 1999, p. 325). At the time we designated critical habitat in 2003, there were 36 occurrences containing between 86 and 93 individuals on Oahu. Currently, there are 19 occurrences totaling approximately 130 individuals in the lowland mesic and lowland wet ecosystems in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Hesperomannia arbuscula (NCN), a small tree or shrub in the sunflower family (Asteraceae), is found on Oahu and Maui (Wagner *et al.* 1999, p. 325). At the time we designated critical habitat in 2003, there were 6 occurrences containing between 90 and 92 individuals in the Waianae Mountains of Oahu. Currently, there are 5 occurrences totaling 14 individuals in the lowland mesic and lowland wet ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Hibiscus brackenridgei (mao hau hele), a shrub in the mallow family (Malvaceae), includes 3 subspecies and is known from Kauai, Oahu, Molokai, Lanai, Maui, and the island of Hawaii (Bates 1999, p. 883–884). At the time we designated critical habitat in 2003, *H. brackenridgei* ssp. *brackenridgei* was known from Molokai, Lanai, Maui, and Hawaii. *Hibiscus brackenridgei* ssp. *mokuleianus* was known from Oahu and Kauai. On Oahu, there were fewer than 206 individuals in 5 occurrences in the Waianae Mountains. Also at that time, *H. brackenridgei* ssp. *molokaiana* was known from one occurrence of five individuals in the Waianae Mountains. Currently, *H. brackenridgei* ssp. *mokuleianus* is known from 7 occurrences totaling between 47 and 50 individuals in the lowland dry and lowland mesic ecosystems in the Waianae Mountains (HBMP 2008; TNC 2007; U.S. Army 2006). *Hibiscus brackenridgei* ssp. *molokaiana* is known from 1 occurrence of 32 individuals in the lowland dry and lowland mesic ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Huperzia nutans (formerly *Phlegmariurus nutans*) (wawaeiole), a fern ally in the hanging fir-moss family (Lycopodiaceae), is known from Kauai and Oahu (Palmer 2003, p. 257). At the time we designated critical habitat in 2003, there were 3 occurrences containing 7 individuals in the Koolau Mountains of Oahu. Currently, there are 2 occurrences totaling between 10 to 15 individuals in the lowland wet and wet cliff ecosystems in the Koolau

Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Isodendrion laurifolium (aupaka), a shrub in the violet family (Violaceae), is known from Kauai and Oahu (Wagner *et al.* 1999, p. 1,329). This species was historically known from both the Koolau and Waianae Mountains in the lowland mesic ecosystem (HBMP 2008). At the time we designated critical habitat in 2003, there were 5 occurrences totaling between 22 and 23 individuals in the Waianae Mountains of Oahu. Currently, there are 5 known occurrences totaling between 24 and 64 individuals in the dry cliff ecosystem in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Isodendrion longifolium (aupaka), a shrub in the violet family (Violaceae), is known from Kauai and Oahu (Wagner *et al.* 1999, pp. 1,329–1,331). At the time we designated critical habitat in 2003, this species was known from 7 occurrences totaling 30 individuals in the Waianae and Koolau Mountains of Oahu. Currently, there are 4 occurrences of *I. longifolium* totaling between 32 and 36 individuals in the lowland mesic and lowland wet ecosystems in the Waianae and Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Isodendrion pyrifolium (wahine noho kula), a shrub in the violet family (Violaceae), is known from Oahu, Maui, Hawaii, Niihau, Molokai, and Lanai (Wagner *et al.* 1999, p. 1,331). At the time we designated critical habitat in 2003, this species was no longer extant on Oahu. Currently, there are no known occurrences on Oahu; however, *I. pyrifolium* was documented in the lowland dry and dry cliff ecosystems in the Waianae Mountains (TNC 2007; HBMP 2008).

Kadua coriacea (formerly *Hedyotis coriacea*) (kioele), a shrub in the coffee family (Rubiaceae), is known from Oahu, Maui, and the island of Hawaii (Wagner *et al.* 1999, p. 1,141). At the time we designated critical habitat in 2003, this species was known only from historical occurrences on Oahu. Currently, there are no known occurrences on Oahu; however, *K. coriacea* is historic to the lowland mesic ecosystem in the Waianae and Koolau Mountains (TNC 2007; HBMP 2008).

Kadua degeneri (formerly *Hedyotis degeneri*) (NCN), a shrub in the coffee family (Rubiaceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, pp. 1,141–1,142). Two varieties have been recognized. *Kadua degeneri* var. *coprosmifolia* occurred in the lowland mesic ecosystem until the late 1980s; however, this occurrence may no longer be extant (T. Motley, pers. comm. 2006; HBMP 2008). *Kadua degeneri* var. *degeneri* was known from 4 occurrences, totaling 60 individuals at the time we designated critical habitat in 2003, and currently there are 4 to 5 occurrences totaling between 280 and 370 individuals, in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Kadua parvula (formerly *Hedyotis parvula*) (NCN), a small shrub in the coffee family (Rubiaceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, pp. 1,149–1,150). At the time we designated critical habitat in 2003, this species was known from 7 occurrences totaling between 116 and 131 individuals. Currently, *K. parvula* is found in 2 occurrences totaling approximately 240 individuals, in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2003, pp. 16–91—16–95; U.S. Army 2006; TNC 2007; HBMP 2008; U.S. Army 2008, p. 2–45).

Labordia cyrtandrae (kamakahala), a shrub in the logania family (Loganiaceae), is endemic to the Waianae and Koolau Mountains of Oahu (Wagner *et al.* 1999, pp. 854–855). At the time we designated critical habitat in 2003, *L. cyrtandrae* was known from the Waianae Mountains, in 10 occurrences containing 20 individuals. Currently, due to an increase in survey efforts over the last 6 years in potentially suitable habitat for this species, there are 3 occurrences totaling 44 individuals in the lowland mesic, lowland wet, montane wet, and wet cliff ecosystems in the Waianae Mountains; and one individual in the lowland wet ecosystem in the Koolau Mountains, with historical occurrences in the lowland mesic and wet cliff ecosystems of the Koolau Mountains (U.S. Army 2006a; U.S. Army 2006b, pp. 3–2–13—3–2–17; TNC 2007; HBMP 2008).

Lepidium arbuscula (anaunau), a shrub in the mustard family (Brassicaceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, p. 406). At the time we designated critical habitat in 2003, there were 10 occurrences totaling approximately 1,000 individuals. Currently, there are 9 occurrences totaling fewer than 900 individuals in the dry cliff ecosystem in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Lipochaeta lobata var. *leptophylla* (nehe), a perennial herb in the sunflower family (Asteraceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, pp. 337–338). At the time we designated critical habitat in 2003, this species was known from 4 occurrences totaling 147 individuals. Currently, there are 4 occurrences of approximately 150 individuals in the dry cliff ecosystem in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Lobelia gaudichaudii ssp. *koolauensis* (NCN), a shrub in the bellflower family (Campanulaceae), is endemic to the Koolau Mountains of Oahu (Lammers 1999, p. 476). At the time we designated critical habitat in 2003, there were 5 occurrences totaling fewer than 270 individuals. Currently, this species is known from 2 occurrences totaling approximately 280 individuals in bogs in the lowland wet ecosystem in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Lobelia monostachya (NCN), a shrub in the bellflower family (Campanulaceae), is endemic to the Koolau Mountains of Oahu (Lammers 1999, p. 478). At the time we designated critical habitat in 2003, *L. monostachya* was known from one occurrence of three individuals. Currently, there are two occurrences (eight individuals) in the lowland mesic ecosystem in the Koolau Mountains (U.S. Army 2006; Oahu PEP Program 2007, p. 33; TNC 2007; HBMP 2008).

Lobelia niihauensis (NCN), a shrub in the bellflower family (Campanulaceae), is known from Oahu, Kauai, and Niihau (Lammers 1999, pp. 478–479). At the time we designated critical habitat in 2003, there were 40 occurrences containing between 362 and 397 individuals in the Waianae Mountains of Oahu. Currently, there are 14 occurrences totaling approximately 400 individuals in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Lobelia oahuensis (NCN), a shrub in the bellflower family (Campanulaceae), is endemic to the Waianae and Koolau Mountains of Oahu (Lammers 1999, p. 479). At the time we designated critical habitat in 2003, this species was known from 12 occurrences totaling 42 individuals. Currently, *L. oahuensis* is found in 7 occurrences totaling 41 individuals in the lowland wet, montane wet, and wet cliff ecosystems in the Waianae Mountains; and in the lowland wet and wet cliff ecosystems in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Lysimachia filifolia (NCN), a small shrub in the primrose family (Primulaceae; Wagner and Herbst 2003, p. 67), is found on Kauai and Oahu (Wagner *et al.* 1999, p. 1,080). At the time we designated critical habitat in 2003, this species was known from 1 occurrence containing 50 individuals in the Koolau Mountains of Oahu.

Currently, *L. filifolia* is found in 2 to 3 occurrences totaling between 50 and 160 individuals in the wet cliff ecosystem in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Marsilea villosa (ihi ihi), a fern in the water clover fern family (Marsiliaceae), is known from Niihau, Molokai, and Oahu (Palmer 2003, pp. 180–182). At the time we designated critical habitat in 2003, this species was known from five occurrences of an unknown number of individuals on Oahu. Currently, *M. villosa* is found in five to six occurrences of an unknown number of individuals in seasonal wetlands of the coastal and lowland dry ecosystems in the Waianae and Koolau Mountains (TNC 2007; HBMP 2008; M. Chau, University of Hawaii, pers. comm. 2009).

Melanthera tenuifolia (formerly *Lipochaeta tenuifolia*) (nehe), a perennial herb in the sunflower family (Asteraceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, p. 343). At the time we designated critical habitat in 2003, this species was known from 41 occurrences containing between 759 and 1,174 individuals. Currently, *M. tenuifolia* is found in 11 occurrences totaling as many as 4,000 individuals in the lowland dry, lowland mesic, and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Melicope lydgatei (alani), a small shrub in the rue family (Rutaceae), is endemic to the Koolau Mountains of Oahu (Stone *et al.* 1999, p. 1,193). At the time we designated critical habitat in 2003, this species was known from 18 occurrences containing an unknown number of individuals. Currently, *M. lydgatei* is found in 5 occurrences totaling 26 individuals in the lowland mesic and lowland wet ecosystems in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Melicope pallida (alani), a tree in the rue family (Rutaceae), is known from Kauai and Oahu (Stone *et al.* 1999, pp. 1,198–1,199). At the time we designated critical habitat in 2003, this species was known from one individual in the Waianae Mountains of Oahu. Currently, one individual is found in the lowland mesic ecosystem in the Waianae Mountains (TNC 2007; HBMP 2008).

Melicope saint-johnii (alani), a tree in the rue family (Rutaceae), is endemic to the Waianae and Koolau Mountains of Oahu (Stone *et al.* 1999, pp. 1,203–1,204). At the time we designated critical habitat in 2003, there were no individuals in the Koolau Mountains, and 6 occurrences totaling fewer than 170 individuals in the Waianae Mountains. Currently, *M. saint-johnii* is found in the lowland mesic and dry cliff ecosystems of the Waianae Mountains, in 2 occurrences totaling as many as 162 individuals (TNC 2007; HBMP 2008). Historically, this species also occurred in the lowland mesic ecosystem in the Koolau Mountains.

Myrsine juddii (kolea), a shrub in the myrsine family (Myrsinaceae), is endemic to the Koolau Mountains of Oahu (Wagner *et al.* 1999, pp. 940–941). At the time we designated critical habitat in 2003, this species was known from 3 occurrences with an estimated 5,000 individuals. Currently, there is a single wide-ranging occurrence, estimated to contain 3,000 individuals, in the lowland wet ecosystem in the Koolau Mountains (U.S. Army 2005, p. 16–123; HBMP 2008).

Neraudia angulata (NCN), a shrub in the nettle family (Urticaceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, pp. 1,302–1,303). At the time we designated critical habitat in 2003, the two recognized varieties, *N. angulata* var. *angulata* and *N. angulata* var. *dentata,* were found in 27 occurrences totaling 51 individuals. Currently, there are 4 occurrences (106 individuals) considered to be *N. angulata* var. *angulata,* and 2 occurrences (3 individuals) considered to be *N. angulata* var. *dentata.* Intermediate forms of the two varieties are found in 2 occurrences totaling over 100 individuals. The six occurrences are found in the lowland dry, lowland mesic, and dry cliff ecosystems in the Waianae Mountains. The numbers of individuals in each occurrence vary widely from year to year (U.S. Army 2003, pp. 16–116—16–119; U.S. Army 2006, pp. 3–1–129—3–1–139; TNC 2007; HBMP 2008).

Nototrichium humile (kului), a shrub in the amaranth family (Amaranthaceae), is known from Oahu and east Maui (Wagner *et al.* 1999, pp. 193–194). At the time we designated critical habitat in 2003, there were 25 occurrences containing between 775 and 995 individuals in the Waianae Mountains of Oahu. Currently, there are 12 occurrences totaling over 1,000 individuals in the lowland dry, lowland mesic, and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006a; U.S. Army 2006b, pp. 3–1–140—3–1–146; TNC 2007; HBMP 2008).

Peucedanum sandwicense (makou), a perennial herb in the parsley family (Apiaceae), is known from Kauai, Molokai, Maui, and Oahu (Constance and Affolter 1999, p. 208; HBMP 2008). At the time we designated critical habitat in 2003, this species was found in 4 occurrences containing 51 individuals in the Waianae Mountains of Oahu. Currently, there are 2 occurrences totaling 61 individuals in the dry cliff ecosystem in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Phyllostegia hirsuta (NCN), a subshrub or vine in the mint family (Lamiaceae), is endemic to the Waianae and Koolau Mountains of Oahu (Wagner *et al.* 1999, p. 817). At the time we designated critical habitat in 2003, this species was known from 26 occurrences totaling between 214 and 227 individuals in the Waianae and Koolau Mountains. Currently, there are 9 occurrences totaling approximately 160 individuals in the lowland mesic, lowland wet, and wet cliff ecosystems in both the Waianae and Koolau Mountains; and in the montane wet ecosystem in the Waianae Mountains (U.S. Army 2006a; U.S. Army 2006b, pp. 3–2–24—3–2–28; TNC 2007; HBMP 2008).

Phyllostegia kaalaensis (NCN), an herb in the mint family (Lamiaceae), is endemic to the Waianae Mountains of Oahu (Wagner 1999, p. 270). At the time we designated critical habitat in 2003, this species was known from 7 occurrences containing fewer than 45 individuals. All of those occurrences (in the lowland mesic and dry cliff ecosystems in the Waianae Mountains) have since then been extirpated. However, there are 14 individuals outplanted in 4 locations in the Waianae Mountains (U.S. Army 2006, pp. 3–1–147—3–1–152).

Phyllostegia mollis (NCN), a perennial herb in the mint family (Lamiaceae), is known from Molokai, Maui, and Oahu (Wagner *et al.* 1999, p. 821). This species was historically known from both the Koolau and Waianae Mountains. At the time we designated critical habitat in 2003, this species was found in 5 occurrences totaling between 85 and 105 individuals only in the Waianae Mountains of Oahu. Currently, *P. mollis* is known from 6 occurrences totaling between 42 and 92 individuals in the lowland mesic and lowland wet ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Phyllostegia parviflora (NCN), a perennial herb in the mint family (Lamiaceae), is known from Oahu, Maui, and the island of Hawaii (Wagner *et al.* 1999, pp. 821–822; Wagner 1999, p. 273). There are three recognized varieties: *Phyllostegia parviflora* var. *glabriuscula* is known only from the island of Hawaii; *P. parviflora* var. *parviflora* is found on Maui and the Koolau Mountains of Oahu; *P.*

parviflora var. *lydgatei* is known from Oahu's Waianae Mountains. At the time we designated critical habitat in 2003, *P. parviflora* var. *parviflora* was known from 30 individuals in 1 occurrence in the Koolau Mountains, and *P. parviflora* var. *lydgatei* was known from 4 individuals in the lowland mesic ecosystem in the Waianae Mountains. Currently, all four wild individuals of *P. parviflora* var. *lydgatei* in the Waianae Mountains are extirpated; however, 100 individuals have been outplanted (TNC 1997, p. A–10; D. Sailer, TNC, in litt. 2006). *Phyllostegia parviflora* var. *parviflora* is known from approximately 100 individuals in the lowland wet and wet cliff ecosystems in the Koolau Mountains, and from historic occurrences in the lowland mesic ecosystem in the Koolau Mountains (NTBG 2007; HBMP 2008).

Plantago princeps (laukahi kuahiwi), a small shrub or perennial herb in the plantain family (Plantaginaceae), is known from Kauai, Oahu, Maui, and Molokai, and occurred historically on the island of Hawaii. *Plantago princeps* is subdivided into four varieties: *P. princeps* var. *anomala* (Kauai), *P. princeps* var. *laxifolia* (Molokai, Maui, Hawaii), *P. princeps* var. *longibracteata* (Kauai and Oahu), and *P. princeps* var. *princeps* (Oahu). At the time we designated critical habitat in 2003, *P. princeps* var. *longibracteata,* known from the lowland wet ecosystem, was no longer extant on Oahu (TNC 2007; HBMP 2008). *Plantago princeps* var. *princeps* was known from 11 occurrences containing between 130 and 180 individuals. Currently, only *P. princeps* var. *princeps* is extant on Oahu, in 7 occurrences totaling between 159 and 232 individuals, in the lowland mesic, lowland wet, and dry cliff ecosystems in the Waianae Mountains, and in the lowland wet and wet cliff ecosystems in the Koolau Mountains. This taxon historically also occurred in the lowland mesic ecosystem in the Koolau Mountains (TNC 2007; HBMP 2008).

Platanthera holochila (NCN), an herb in the orchid family (Orchidaceae), is known from Kauai, Oahu, Molokai, and Maui (Wagner *et al.* 1999, p. 1,474). This species was last collected on Oahu in 1938, in bog hummocks in the lowland wet ecosystem in the Koolau Mountains (TNC 2007; HBMP 2008).

Pteris lidgatei (NCN), a terrestrial fern in the maidenhair fern family (Adiantaceae), is known from Maui, Molokai, and Oahu (Wagner 1949, p. 445; Palmer 2003, pp. 227–229). At the time we designated critical habitat in 2003, this species was found in 9 occurrences totaling 13 individuals in the Koolau Mountains of Oahu. Currently, there are 5 occurrences totaling between 17 and 24 individuals in the lowland wet ecosystem in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Sanicula mariversa (NCN), a perennial herb in the parsley family (Apiaceae), is endemic to the Waianae Mountains of Oahu (Constance and Affolter, pp. 209–210). At the time we designated critical habitat in 2003, this species was known from 4 occurrences containing approximately 170 individuals. Currently, *S. mariversa* is found in 2 occurrences totaling as many as 188 individuals in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006a; U.S. Army 2006b, pp. 3–1–169—3–1–174; TNC 2007; HBMP 2008).

Sanicula purpurea (NCN), a stout perennial herb in the parsley family (Apiaceae), is known from Maui and Oahu (Constance and Affolter 1999, p. 210). At the time we designated critical habitat in 2003, there were 5 occurrences totaling 21 individuals in the Koolau Mountains. Currently, *S. purpurea* is found in 5 occurrences totaling 24 individuals in bogs in the lowland wet ecosystem and in the wet cliff ecosystem in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Schiedea hookeri (NCN), a perennial herb in the pink family (Caryophyllaceae), is known from Oahu and from a fragmentary collection from Maui that may represent a different species (Wagner *et al.* 1999, p. 514). At the time we designated critical habitat in 2003, this species was known from 17 occurrences containing between 328 and 378 individuals in the Waianae Mountains of Oahu. Currently, *S. hookeri* is found in 17 occurrences totaling approximately the same number of individuals, in the lowland dry, lowland mesic, lowland wet, dry cliff, and wet cliff ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Schiedea kaalae (NCN), a nearly stemless plant in the pink family (Caryophyllaceae), is endemic to the Waianae and Koolau Mountains of Oahu (Wagner *et al.* 1999, p. 515). At the time we designated critical habitat in 2003, this species was known from 7 occurrences totaling 49 individuals in the Waianae and Koolau Mountains. Currently, *S. kaalae* is found in 9 occurrences totaling 40 individuals, in the lowland mesic, lowland wet, and wet cliff ecosystems in the Waianae Mountains, and in the lowland mesic and wet cliff ecosystems in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Schiedea kealiae (maolioli), a subshrub in the pink family (Caryophyllaceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, p. 515). At the time we designated critical habitat in 2003, this species was known from 4 occurrences totaling between 265 and 315 individuals in the Waianae Mountains. Currently, *S. kealiae* is found in 1 occurrence totaling between 50 and 100 individuals, in the lowland dry ecosystem in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008). Historic occurrences were known from the coastal ecosystem (HBMP 2008).

Schiedea nuttallii (NCN), a subshrub in the pink family (Caryophyllaceae), is known from Kauai, Oahu, Molokai, and Maui (Wagner *et al.* 1999, pp. 517–519). At the time we designated critical habitat in 2003, this species was found in 7 occurrences with 49 individuals in the Waianae Mountains. Currently, there are 2 occurrences totaling between 41 and 54 individuals in the lowland mesic ecosystem in the Waianae Mountains (U.S. Army 2006a; TNC 2007; HBMP 2008). Historical occurrences of this species were also known from the lowland mesic ecosystem in the Koolau Mountains (TNC 2007; HBMP 2008).

Schiedea obovata (formerly *Alsinidendron obovatum*) (NCN), a subshrub in the pink family (Caryophyllaceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, p. 501). At the time we designated critical habitat in 2003, *S. obovata* was known from 6 occurrences containing 8 to 10 individuals in the Waianae Mountains. Currently, this species is found in 2 to 3 occurrences, totaling between 14 and 44 individuals, in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006a; U.S. Army 2006b, pp. 3–1–190—3–1–197; TNC 2007; HBMP 2008).

Schiedea trinervis (formerly *Alsinidendron trinerve*) (NCN), a subshrub in the pink family (Caryophyllaceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, p. 501). At the time we designated critical habitat in 2003, this species was known from 13 occurrences totaling between 18 and 34 individuals. Currently, *S. trinervis* is found in 2 occurrences, totaling 192 individuals, in the montane wet, dry cliff, and wet cliff ecosystems in the Waianae Mountains (U.S. Army 2006a; U.S. Army 2005, pp. 16–151—16–153; TNC 2007; HBMP 2008).

Sesbania tomentosa (ohai), a shrub in the pea family (Fabaceae), is known from all of the main Hawaiian Islands, and from the Northwestern Hawaiian Islands of Necker and Nihoa (Geesink *et al.* 1999, pp. 704–705). At the time we designated critical habitat in 2003, this species was known from Kauai, Oahu, Molokai, Kahoolawe, Maui, Hawaii, Nihoa, and Necker. On Oahu, *S. tomentosa* was found in 3 occurrences totaling 55 individuals. Currently on Oahu, there are 2 outplanted occurrences totaling approximately 30 individuals in the coastal ecosystem at Kaena Point and Kaohikaipu islet (U.S. Army 2006; TNC 2007; HBMP 2008).

Silene lanceolata (NCN), a subshrub in the pink family (Caryophyllaceae), is known from Kauai, Oahu, Lanai, Molokai, and Hawaii (Wagner *et al.* 1999, p. 523). At the time we designated critical habitat in 2003, there were 4 occurrences with a total of 62 individuals in the Waianae Mountains of Oahu. Currently, *S. lanceolata* is found in 3 occurrences totaling between 100 and 130 individuals, in the dry cliff ecosystem in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Silene perlmanii (NCN), a subshrub in the pink family (Caryophyllaceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, pp. 523–524). Historical occurrences of this species were known from the lowland mesic and dry cliff ecosystems (HBMP 2008). At the time we designated critical habitat in 2003, this species was presumed extirpated. Currently, *S. perlmanii* is in propagation, and 15 individuals were outplanted in the Honouliuli Preserve between 2003 and 2006. However, as of 2007, only three plants were extant (D. Sailer, TNC, pers. comm. 2007).

Solanum sandwicense (popolo aiakeakua), a shrub in the nightshade family (Solanaceae), is known from Kauai and the lowland mesic ecosystem in the Waianae and Koolau Mountains of Oahu (Symon 1999, p. 1,275). This species was last observed on Oahu in 2000, in the Waianae Mountains. Currently, there are at least six outplantings of this species totaling an unknown number of individuals in the Waianae Mountains (PEP Program 2007, p. 27; TNC 2007; HBMP 2008).

Spermolepis hawaiiensis (NCN), an annual herb in the parsley family (Apiaceae), is known from Oahu and Maui (Constance and Affolter 1999, p. 212). At the time we designated critical habitat in 2003, there were 6 occurrences totaling between 110 and 910 individuals in the Waianae and Koolau Mountains (Diamond Head), in the lowland dry and dry cliff ecosystems (U.S. Army 2006; HBMP 2008). Currently, *S. hawaiiensis* is found in 4 occurrences totaling several hundred to thousands of individuals, depending on annual weather conditions (U.S. Army 2006; TNC 2007; HBMP 2008).

Stenogyne kanehoana (NCN), a vine in the mint family (Lamiaceae), is endemic to the Waianae Mountains of Oahu (Weller and Sakai 1999, pp. 838–839). At the time we designated critical habitat in 2003, this species was known from a recently extirpated occurrence of two individuals, and a newly discovered occurrence (in 2000) of one to six individuals in the lowland mesic ecosystem in the Waianae Mountains. Currently, the occurrence discovered in 2000 is no longer extant; however, another individual was discovered in 2004, and may persist at this time (U.S. Army 2005, pp. 16–155—16–157; U.S. Army 2006a; TNC 2007; HBMP 2008).

Tetramolopium filiforme (NCN), a dwarf shrub in the sunflower family (Asteraceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, p. 366). At the time we designated critical habitat in 2003, there were 21 occurrences containing 253 individuals. Currently, this species is found in the dry cliff ecosystem in the Waianae Mountains, in 6 occurrences totaling almost 3,000 individuals (U.S. Army 2006b, pp. 3–1–198—3–1–204; TNC 2007; HBMP 2008). The large increase in the number of individuals is likely due to an increase in survey efforts over the past 6 years in potentially suitable habitat for this species (U.S. Army 2006b, p. 3–1–202).

Tetramolopium lepidotum ssp. *lepidotum* (NCN), a shrub in the sunflower family (Asteraceae), is known from Lanai, Maui, and Oahu (Wagner *et al.* 1999, p. 367). At the time we designated critical habitat in 2003, there were 5 occurrences of approximately 15 individuals in the Waianae Mountains of Oahu. Currently, this species is found in 3 occurrences totaling 65 individuals, in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Tetraplasandra gymnocarpa (ohe ohe), a tree in the ginseng family (Araliaceae), is endemic to the Koolau Mountains of Oahu, and was historically known from one location in the Waianae Mountains (Lowry 1999, p. 234). At the time we designated critical habitat in 2003, there were 30 occurrences totaling fewer than 100 individuals in the Koolau Mountains. Currently, there are 13 occurrences totaling approximately 140 individuals in the lowland mesic, lowland wet, and wet cliff ecosystems in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Trematolobelia singularis (NCN), a shrub in the bellflower family (Campanulaceae), is endemic to the Koolau Mountains of Oahu (Lammers 1999, p. 488). At the time we designated critical habitat in 2003, there were 3 occurrences totaling 165 individuals. Currently, *T. singularis* is found in 4 occurrences totaling approximately 360 individuals in the lowland wet and wet cliff ecosystems in the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Urera kaalae (opuhe), a small tree or shrub in the nettle family (Urticaceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, pp. 1,313–1,314). At the time we designated critical habitat in 2003, there were 12 occurrences containing 41 individuals. Currently, *U. kaalae* is found in 4 occurrences totaling between 49 and 60 individuals, in the lowland mesic and lowland wet ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

Vigna o-wahuensis (NCN), a twining annual or perennial herb in the pea family (Fabaceae), is known from Niihau, Oahu, Molokai, Lanai, Kahoolawe, Maui, and Hawaii (Geesink *et al.* 1999, p. 720). The last collection from Oahu was made on the Mokulua Islets and North Islet, off Oahu's northeastern coast, in 1938, in the coastal ecosystem (HBMP 2008). At the time we designated critical habitat in 2003, there were no known occurrences, and currently, there are still no known occurrences on Oahu's offshore islets (TNC 2007; HBMP 2008).

Viola chamissoniana ssp. *chamissoniana* (pamakani), a shrub in the violet family (Violaceae), is endemic to the Waianae Mountains of Oahu (Wagner *et al.* 1999, p. 1,333). At the time we designated critical habitat in 2003, there were 15 occurrences containing 59 individuals. Currently, this species is found in 8 occurrences totaling slightly more than 600 individuals in the lowland mesic and dry cliff ecosystems in the Waianae Mountains (U.S. Army 2006b, pp. 3–1–205—3–1–210; TNC 2007; HBMP 2008).

Viola oahuensis (NCN), a subshrub in the violet family (Violaceae), is endemic to the Koolau Mountains of Oahu (Wagner *et al.* 1999, p. 1,336). At the time we designated critical habitat in 2003, there were 18 occurrences totaling fewer than 200 individuals. Currently, there are 8 occurrences totaling approximately 170 individuals in the lowland wet and wet cliff ecosystems in

the Koolau Mountains (U.S. Army 2006; TNC 2007; HBMP 2008).

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 124 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 124 species, including site-specific species information from the HBMP database (HBMP 2008), the Army Environmental Division database (U.S. Army 2006), and our own rare plant database;
- Species information from the plant database housed at NTBG;
- Oahu map of important habitat for the recovery of plants protected under the Act (Service 1999, p. F–7);
- The Nature Conservancy's Ecoregional Assessment of the Hawaiian High Islands (2006) and ecosystem maps (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 Honolulu County (2008);
- Final critical habitat designation for listed plant species on the island of Oahu (June 17, 2003, 68 FR 35950);
- Recent biological surveys and reports; and
- Discussions with qualified individuals familiar with these species and ecosystems (HBMP 2008; TNC 2007; NTBG 2007; PEP 2007; D. Polhemus, pers. comm. 2008; A. Bakutis, in litt. 2006).

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 or 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.

(6) 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 99 Oahu plants based on new information received since 2003 and the need to designate unoccupied habitat to conserve the species. In addition, the Recovery Plan for the Oahu Plants (Service 1998, p. vii) identifies several actions needed to recover these species, including: (1) Protection of 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 or biological features required for each of the 99 Oahu plants based on studies of their habitat, ecology, and life history; information in the 2003 critical habitat designations; and new scientific information that has become available since that time.

In 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 (68 FR 35950; June 17, 2003). No unoccupied habitat was designated as critical habitat in the 2003 final rule. In this proposed rule, we are proposing critical habitat in areas occupied by the species 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 also been more precisely identified, 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 are marginal habitat; the species occurs in these areas due to remoteness or inaccessibility to feral ungulates.

Since the 2003 critical habitat designations were limited to occupied areas only, the designation did not include all of the geographic areas essential for the conservation of the species. For occupied areas, the essential physical or biological features are the focus for necessary special management considerations or protections, whereas for unoccupied habitat, the area itself is the focus for conservation actions. We have determined that the physical or biological features described in 2003 can be improved to better identify special management considerations that may be necessary, 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 the historic range, provide a more comprehensive view of the recovery needs and relevant geographic areas for 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 124 species for which we are proposing critical habitat. We identify these features in areas occupied by the species 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 and biological features that, when laid out in the appropriate quantity and spatial arrangement to provide for a species' life-history processes, are essential to the conservation of the species. The appropriate quantity and spatial arrangement defined for this proposed rule takes into consideration the ecosystems in which each species occurs and reflects a distribution that we believe achieves the species' recovery needs within those ecosystems. In this proposal, PCEs for each of the

124 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 water quantity (damselflies), we consider the physical or biological features present in the ecosystems described in this proposed rule to provide the necessary PCEs for each species in this proposal. The ecosystems' 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); adequate instream flows and upland habitat for cover and foraging for the damselfly species; maintenance of upland habitat so that it provides for the proper ecological functioning of streams for the damselflies (e.g., water quality, water temperature); 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 these species, which 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 scientific information available. Accordingly, for purposes of this proposed rule, the physical or biological features of a properly functioning ecosystem are the physical or biological features essential to the conservation of the 124 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 proposed rule requires the physical or biological features for each ecosystem in which that species occurs, as noted in Table 5. 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,'' and are 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.

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TABLE 4.— PHYSICAL OR BIOLOGICAL FEATURES IN EACH ECOSYSTEM (READ IN ASSOCIATION WITH TABLE 5)

	Physical or Biological Features					
				Associated native plant genera		
Ecosystem	Elevation	Annual Precipitation	Substrate	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*

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 to 6,500 ft (1,000 to 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*
Dry Cliff[6]	unrestricted	< 75 in (< 190 cm)	> 65 degree slope, rocky talus	none	*Antidesma, Chamaesyce, Diospyros, Dodonaea*	*Bidens, Eragrostis, Melanthera, Schiedea*
Wet Cliff[7]	unrestricted	> 75 in (> 190 cm)	> 65 degree slope, shallow soils, weathered lava	none	*Broussaisia, Cheirodendron, Leptecophylla, Metrosideros*	Ferns, Bryophytes, *Coprosma, Dubautia, Kadua, Peperomia*

[1] The physical or biological features for species in the Coastal ecosystem apply to the following ecosystem units: Oahu–Coastal–Units 1–15.

[2] The physical or biological features for species in the Lowland Dry ecosystem apply to the following plant ecosystem units: Oahu–Lowland Dry–Units 1–11.

[3] The physical or biological features for species in the Lowland Mesic ecosystem apply to the following plant ecosystem units: Oahu–Lowland Mesic–Units 1–7, and to the following damselfly ecosystem units: *Megalagrion oceanicum* Unit 1–Lowland Mesic.

[4] The physical or biological features for species in the Lowland Wet ecosystem apply to the following plant ecosystem units: Oahu–Lowland Wet–Units 1–16, and to the following damselfly ecosystem units: *Megalagrion leptodemas* Units 1–11–Lowland Wet, *M. nigrohamatum nigrolineatum* Units 1–11–Lowland Wet, and *M. oceanicum* Units 2–12–Lowland Wet.

[5] The physical or biological features for species in the Montane Wet ecosystem apply to the following plant ecosystem units: Oahu–Montane Wet–Unit 1.

[6] The physical or biological features for species in the Dry Cliff ecosystem apply to the following plant ecosystem units: Oahu–Dry Cliff–Units 1–8.

[7] The physical or biological features for species in the Wet Cliff ecosystem apply to the following plant ecosystem units: Oahu–Wet Cliff–Units 1–8, and to the following damselfly ecosystem units: *Megalagrion leptodemas* Units 12–14–Wet Cliff, *M. oceanicum* Units 13–15–Wet Cliff.

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Plants								
Abutilon sandwicense			X			X		
Achyranthes splendens var. *rotundata*	X	X				X		
Adenophorus periens				X			X	
Alectryon macrococcus			X		X	X		
Bidens amplectens	X	X						
Bonamia menziesii		X	X			X		

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Cenchrus agrimonioides			X			X		
Centaurium sebaeoides	X							
Chamaesyce celastroides var. *kaenana*	X	X	X					
Chamaesyce deppeana							X	
Chamaesyce herbstii			X			X		
Chamaesyce kuwaleana	X					X		
Chamaesyce rockii				X			X	

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	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Chamaesyce skottsbergii var. *skottsbergii*		X						coral outcrop substrate
Colubrina oppositifolia			X					
Ctenitis squamigera			X					
Cyanea acuminata			X	X	X		X	
Cyanea calycina			X	X	X		X	
Cyanea crispa			X	X			X	
Cyanea grimesiana ssp.			X	X				

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	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
grimesiana								
Cyanea grimesiana ssp. *obatae*			X	X		X		
Cyanea humboldtiana				X			X	
Cyanea koolauensis				X				
Cyanea lanceolata			X	X				
Cyanea longiflora			X					
Cyanea pinnatifida			X					

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Cyanea purpurellifolia				X			X	
Cyanea st.-johnii				X			X	
Cyanea superba			X					
Cyanea truncata			X	X			X	
Cyperus pennatiformis			X					
Cyperus trachysanthos	X	X						seasonal wetlands
Cyrtandra dentata			X	X		X		

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Cyrtandra gracilis				X				
Cyrtandra kaulantha				X			X	
Cyrtandra polyantha			X	X				
Cyrtandra sessilis				X			X	
Cyrtandra subumbellata				X			X	
Cyrtandra viridiflora				X			X	

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Cyrtandra waiolani			X	X				
Delissea subcordata			X					
Diellia erecta			X					
Diellia falcata			X			X		
Diellia unisora			X			X		
Diplazium molokaiense			X	X				
Doryopteris takeuchii		X						

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Dubautia herbstobatae			X			X		
Eragrostis fosbergii			X			X		
Eugenia koolauensis			X					
Euphorbia haeleeleana		X	X					
Flueggea neowawraea			X			X		
Gardenia mannii			X	X				

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Gouania meyenii		X	X			X		
Gouania vitifolia		X	X	X		X		
Hesperomannia arborescens			X	X				
Hesperomannia arbuscula			X	X				
Hibiscus brackenridgei		X	X					
Huperzia nutans				X			X	
Isodendrion laurifolium			X			X		

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Isodendrion longifolium			X	X				
Isodendrion pyrifolium		X				X		
Kadua coriacea			X					
Kadua degeneri			X			X		
Kadua parvula			X			X		
Korthalsella degeneri						X		host plants *Sapindus oahuensis* and *Nestegis sandwicensis*

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Labordia cyrtandrae			X	X	X		X	
Lepidium arbuscula						X		
Lipochaeta lobata var. *leptophylla*						X		
Lobelia gaudichaudii ssp. *koolauensis*				X				bogs
Lobelia monostachya			X					
Lobelia niihauensis			X			X		
Lobelia oahuensis				X	X		X	

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Lysimachia filifolia							X	
Marsilea villosa	X	X						seasonal wetlands
Melanthera tenuifolia		X	X			X		
Melicope christophersenii					X		X	
Melicope hiiakae				X				
Melicope lydgatei			X	X				
Melicope makahae			X	X		X		

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Melicope pallida			X					
Melicope saint-johnii			X			X		
Myrsine judii				X				
Neraudia angulata		X	X			X		
Nototrichium humile		X	X			X		
Peucedanum sandwicense						X		
Phyllostegia hirsuta			X	X	X		X	

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	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Phyllostegia kaalaensis			X			X		
Phyllostegia mollis			X	X				
Phyllostegia parviflora var. *lydgatei*			X					
Phyllostegia parviflora var. *parviflora*			X	X			X	
Plantago princeps var. *longibracteata*				X				

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Plantago princeps var. *princeps*			X	X		X	X	
Platanthera holochila				X				bog hummocks
Platydesma cornuta var. *cornuta*				X				
Platydesma cornuta var. *decurrens*			X			X		
Pleomele forbesii		X	X	X		X		
Psychotria hexandra ssp. *oahuensis*				X			X	
Pteralyxia macrocarpa			X	X		X	X	

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	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Pteris lidgatei				X				
Sanicula mariversa			X			X		
Sanicula purpurea				X			X	bogs
Schiedea hookeri		X	X	X		X	X	
Schiedea kaalae			X	X			X	
Schiedea kealiae	X	X						

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	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Schiedea nuttallii			X					
Schiedea obovata			X			X		
Schiedea trinervis					X	X	X	
Sesbania tomentosa	X							
Silene lanceolata						X		
Silene perlmanii			X			X		
Solanum sandwicense			X					

TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Spermolepis hawaiiensis		X				X		
Stenogyne kanehoana			X					
Tetramolopium filiforme						X		
Tetramolopium lepidotum ssp. *Lepidotum*			X			X		
Tetraplasandra gymnocarpa			X	X			X	
Tetraplasandra lydgatei			X					

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	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Trematolobelia singularis				X			X	
Urera kaalae			X	X				
Vigna o-wahuensis	X							
Viola chamissoniana ssp. *chamissoniana*			X			X		
Viola oahuensis				X			X	
Zanthoxylum oahuense				X				

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TABLE 5.— PRIMARY CONSTITUENT ELEMENTS FOR THE OAHU 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

	Coastal	Lowland Dry	Lowland Mesic	Lowland Wet	Montane Wet	Dry Cliff	Wet Cliff	Unique PCEs for Species
Animals								
blackline Hawaiian damselfly				X				perennial stream, slow reaches of streams or pools
crimson Hawaiian damselfly				X			X	perennial stream, slow reaches of streams or pools
oceanic Hawaiian damselfly			X	X			X	perennial stream, swift-flowing sections and riffles of streams

Note: Total number of species in table is greater than 124 because we identify the applicable ecosystems and unique PCEs for the Oahu varieties of *Phyllostegia parviflora* and *Plantago princeps*

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, *Cyanea calycina* will occur in association with different native plant species, and other attributes, depending on whether it is found within the lowland mesic, lowland wet, montane wet, 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 *Zanthoxylum oahuense,* we look at Table 5 to see that the PCEs for *Z. oahuense* are provided by the physical or biological features in the lowland wet ecosystem. Table 4 indicates that the physical or biological features in the lowland wet ecosystem include elevations of less than 3,281 ft (1,000 m); annual precipitation of more than 75 in (190 cm); clays, ashbeds, deep well-drained soils, and lowland bogs; and one or more genera of the subcanopy and understory plants *Alyxia, Cibotium, Claoxylon, Cyrtandra, Dicranopteris, Diplazium, Kadua, Machaerina, Melicope, Microlepia;* and one or more of the genera of the canopy species *Antidesma, Metrosideros, Myrsine, Pisonia,* and *Psychotria.* As we do not specifically know the unique PCEs for *Z. oahuense,* and this plant is found only in the lowland wet ecosystem, we believe that the physical or biological features for the lowland wet ecosystem best approximate the PCEs for *Z. oahuense.* Thus, the physical or biological features provided in the ecosystem in which *Z. oahuense* is found are the PCEs for *Z. oahuense.*

As another example, Table 5 indicates the physical or biological features for the crimson Hawaiian damselfly include the physical or biological features for the lowland wet or wet cliff ecosystems, depending on the location, and also that this species has a species-specific PCE, which is a perennial stream with slow reaches. The PCEs for the crimson Hawaiian damselfly are thus composed of the physical or biological features for each of the two ecosystems it occupies, as described in Table 4 for the lowland wet and wet cliff ecosystems, as well as perennial streams with slow reaches (i.e., stream areas with no riffles or rapids). Table 5 is read in a similar fashion in conjunction with Table 4 to describe the PCEs for each of the 124 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 124 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 each of the seven ecosystems addressed in this proposed rule does not form a single contiguous area, the ecosystems are divided into geographic units. The 7 ecosystem areas are divided into 66 critical habitat units.

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 some of the areas, 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 are or have occupied these habitats. A properly functioning ecosystem provides the life-history requirements of the species that make up that ecosystem, and the physical and 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 124 species for which critical habitat is here proposed, we have determined that a designation limited to known present range of each species would be inadequate to achieve the conservation of those species. The areas believed to be unoccupied have been determined to be essential for the conservation and recovery of the species and will promote conservation actions to restore their historical, geographical, and ecological representation on Oahu. For seven of the plant species reported from Oahu and other Hawaiian Islands, *Adenophorus periens* (extant on Kauai, Molokai, Hawaii), *Cyperus pennatiformis* var. *pennatiformis* ((*Mariscus pennatiformis*), extant on Maui and Kauai), *Diplazium molokaiense* (extant on Maui), *Isodendrion pyrifolium* (extant on Hawaii), *Kadua coriacea* ((*Hedyotis coriacea*), extant on Maui, Kauai), *Platanthera holochila* (extant on Kauai, Molokai, and Maui), and *Vigna o-wahuensis* (extant on Hawaii, Kahoolawe, Lanai, Molokai, Maui), we are proposing to designate unoccupied areas only, as these species are not believed to be extant on Oahu. For *Cyrtandra waiolani,* a plant known only from Oahu, we are proposing to designate potentially unoccupied areas only, because the identity of a plant observed in 2005, and believed to possibly be this species, cannot be confirmed until flowers or fruit are available. Critical habitat boundaries for all species were delineated to clearly depict and promote the recovery and conservation of these species by incorporating the functioning ecosystems on which they depend.

With the exception of the seven above plant species believed to no longer be extant on Oahu, and *Cyrtandra waiolani,* which may no longer be extant in the wild, each of the critical habitat units in these ecosystems contain both occupied areas and areas that are currently unoccupied but essential for the conservation of the species. Because of their small numbers or low population sizes, each of the 124 species requires suitable habitat and space for the expansion of existing populations to achieve a level that could approach recovery. For example, although *Cyanea calycina* is found in multiple critical habitat units across

four ecosystem types, its entire distribution is comprised of only 325 to 339 individuals (U.S. Army 2006; HBMP 2008). The unoccupied areas within each unit where the species occurs are essential for the expansion of this species to achieve viable population numbers and maintain its historical geographical and ecological distribution.

Current and historical species location information was used to develop initial critical habitat boundaries (polygons) in each of the 7 ecosystems that would provide for the conservation of the 124 species addressed in this proposed rule. While all 3 damselfly species are historically known from both the Koolau and Waianae Mountains, 85 of the 121 plant species for which we propose critical habitat are historically known from only one mountain range on Oahu. Forty-nine plant species (*Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Bidens amplectens, Cenchrus agrimonioides* var. *agrimonioides, Chamaesyce herbstii, C. skottsbergii* var. *skottsbergii, Colubrina oppositifolia, Cyanea grimesiana* ssp. *obatae, C. pinnatifida, Cyanea superba, Cyperus pennatiformis* var. *pennatiformis, C. trachysanthos, Diellia unisora, Diplazium molokaiense, Dubautia herbstobatae, Eragrostis fosbergii, Euphorbia haeleeleana, Flueggea neowawraea, Gouania vitifolia, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion pyrifolium, Kadua degeneri, K. parvula, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niiahuensis, Melanthera tenuifolia, Melicope christophersenii, M. makahae, M. pallida, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Platydesma cornuta* var. *decurrens, Sanicula mariversa, Schiedea hookeri, S. kealiae, S. obovata, S. trinervis, Silene lanceolata, S. perlmanii, Stenogyne kanehoana, Tetramolopium filiforme, T. lepidotum* ssp. *lepidotum, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana*) are known only from the Waianae Mountains. Thirty-six plant species (*Adenophorus periens, Chamaesyce deppeana, C. rockii, Cyanea crispa, C. humboldtiana, C. koolauensis, C. lanceolata, C. purpurellifolia, C. st.-johnii, C. truncata, Cyrtandra gracilis, C. kaulantha, C. polyantha, C. sessilis, C. subumbellata, C. viridiflora, C. waiolani, Diellia erecta, Doryopteris takeuchii, Huperzia nutans, Lobelia gaudichaudii* ssp. *koolauensis, L. monostachya, Lysimachia filifolia, Melicope hiiakae, M. lydgatei, Myrsine juddii, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, T. lydgatei, Trematolobelia singularis, Viola oahuensis,* and *Zanthoxylum oahuense*) are known only from the Koolau Mountains. For these species, we are proposing to designate critical habitat only in ecosystems within the mountain range of their historical occurrence. The initial polygons were superimposed over digital topographic maps of the island of Oahu 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 habitat containing the physical or biological features essential for the recovery and conservation of the 124 species, including that needed for expansion of reduced populations. The approximate size of each of the 66 plant critical habitat units and the 40 damselfly critical habitat units, and the status of their land ownership, are identified in Tables 5A and 5B, respectively. The species that currently occupy each of the 66 plant and 40 damselfly units are identified in Table 7A, along with areas determined to be exempt from critical habitat designation under section 4(a)(3) of the Act (for summary of exemptions, see Table 7B; see also Exemptions, below, for further information). Table 7A also identifies the areas designated for *Cyrtandra waiolani* (a species that may no longer be extant in the wild) that may be currently unoccupied by this species. All 40 damselfly critical habitat units overlap areas that are 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 124 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 121 OAHU PLANT SPECIES

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Land ownership (acres)			
			State	Federal	City and county	Private
Oahu—Coastal						
—Unit 1	958	388	957	0	0	2
—Unit 2	12	5	12	0	0	0
—Unit 3	15	6	15	0	0	0
—Unit 4	3	1	3	0	0	0
—Unit 5	12	5	12	0	0	0
—Unit 6	9	4	9	0	0	0
—Unit 7	67	27	67	0	0	0
—Unit 8	10	4	10	0	0	0
—Unit 9	84	34	84	0	0	0
—Unit 10	74	30	0	0	74	0
—Unit 11	20	8	0	0	20	0
—Unit 12	11	5	0	0	11	0

TABLE 6A—CRITICAL HABITAT PROPOSED FOR 121 OAHU PLANT SPECIES—Continued

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Land ownership (acres)			
			State	Federal	City and county	Private
—Unit 13	24	10	0	0	19	4
—Unit 14	4	2	0	2	0	2
—Unit 15	34	14	0	31	0	2
TOTAL Coastal	1,339	542	1,169	33	124	10
Oahu—Lowland Dry						
—Unit 1	102	41	49	0	0	54
—Unit 2	29	12	29	0	0	0
—Unit 3	25	10	0	25	0	0
—Unit 4	18	7	0	18	0	0
—Unit 5	8	3	0	8	0	0
—Unit 6	287	116	287	0	0	0
—Unit 7	15	6	15	0	0	0
—Unit 8	292	118	207	0	0	84
—Unit 9	40	16	1	17	20	3
—Unit 10	43	17	43	0	0	0
—Unit 11	166	67	0	166	0	0
TOTAL Lowland Dry	1,025	413	631	234	20	141
Oahu—Lowland Mesic						
—Unit 1	4,450	1,801	3,564	0	583	303
—Unit 2	1,063	430	1,063	0	0	0
—Unit 3	353	143	353	0	0	0
—Unit 4	20	8	20	0	0	0
—Unit 5	29	12	29	0	0	0
—Unit 6	247	100	12	0	0	235
—Unit 7	1,669	676	683	0	130	857
TOTAL Lowland Mesic	7,831	3,170	5,724	0	713	1,395
Oahu—Lowland Wet						
—Unit 1	541	219	428	0	112	0
—Unit 2	20	8	20	0	0	0
—Unit 3	29	12	29	0	0	0
—Unit 4	27	11	27	0	0	0
—Unit 5	76	31	74	2	0	0
—Unit 6	790	320	0	0	0	790
—Unit 7	1,790	724	1,501	0	0	289
—Unit 8	3,041	1,231	1,385	0	0	1,656
—Unit 9	15,728	6,365	2,921	4,510	148	8,148
—Unit 10	124	50	0	0	0	124
—Unit 11	124	50	0	0	124	0
—Unit 12	53	21	0	0	27	26
—Unit 13	161	65	13	52	96	0
—Unit 14	478	193	282	0	196	0
—Unit 15	407	165	407	0	0	0
—Unit 16	2,507	1,014	1,534	0	365	607
TOTAL Lowland Wet	25,896	10,479	8,621	4,564	1,068	11,640
Oahu—Montane Wet						
—Unit 1	370	150	353	0	17	0
TOTAL Montane Wet	370	150	353	0	17	0
Oahu—Dry Cliff						
—Unit 1	49	20	49	0	0	0
—Unit 2	412	167	321	0	91	0
—Unit 3	450	182	101	0	349	0
—Unit 4	108	44	26	82	0	0
—Unit 5	26	10	0	26	0	0
—Unit 6	255	103	150	105	0	0
—Unit 7	208	84	96	113	0	0
—Unit 8	259	105	259	0	0	0

TABLE 6A—CRITICAL HABITAT PROPOSED FOR 121 OAHU PLANT SPECIES—Continued

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Land ownership (acres)			
			State	Federal	City and county	Private
TOTAL Dry Cliff	1,767	715	1,002	326	440	0
Oahu—Wet Cliff						
—Unit 1	235	95	167	0	68	0
—Unit 2	7	3	5	2	0	0
—Unit 3	16	6	16	0	0	0
—Unit 4	23	9	23	0	0	0
—Unit 5	43	17	23	20	0	0
—Unit 6	151	61	151	0	0	0
—Unit 7	144	58	144	0	0	0
—Unit 8	4,649	1,881	1,666	5	1,280	1,698
TOTAL Wet Cliff	5,268	2,130	2,195	27	1,348	1,698
TOTAL ALL UNITS	43,491	17,603	19,695	5,184	3,730	14,884

TABLE 6B—CRITICAL HABITAT PROPOSED FOR 3 OAHU DAMSELFLY SPECIES

[Totals may not sum due to rounding]

Proposed critical habitat unit	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	City and county	Private
Crimson Hawaiian Damselfly—Lowland Wet						
—Unit 1	790	320	0	0	0	790
—Unit 2	1,790	724	1,501	0	0	289
—Unit 3	3,041	1,231	1,385	0	0	1,656
—Unit 4	15,728	6,365	2,921	4,510	148	8,148
—Unit 5	124	50	0	0	0	124
—Unit 6	124	50	0	0	124	0
—Unit 7	53	21	0	0	27	26
—Unit 8	161	65	13	52	96	0
—Unit 9	478	193	282	0	196	0
—Unit 10	407	165	407	0	0	0
—Unit 11	2,507	1,014	1,534	0	365	607
TOTAL Crimson Hawaiian Damselfly—Lowland Wet	25,203	10,198	8,043	4,562	956	11,640
Crimson Hawaiian Damselfly—Wet Cliff						
—Unit 12	151	61	151	0	0	0
—Unit 13	144	58	144	0	0	0
—Unit 14	4,649	1,881	1,666	5	1,280	1,698
TOTAL Crimson Hawaiian Damselfly—Wet Cliff	4,944	2,000	1,961	5	1,280	1,698
Blackline Hawaiian Damselfly—Lowland Wet						
—Unit 1	790	320	0	0	0	790
—Unit 2	1,790	724	1,501	0	0	289
—Unit 3	3,041	1,231	1,385	0	0	1,656
—Unit 4	15,728	6,365	2,921	4,510	148	8,148
—Unit 5	124	50	0	0	0	124
—Unit 6	124	50	0	0	124	0
—Unit 7	53	21	0	0	27	26
—Unit 8	161	65	13	52	96	0
—Unit 9	478	193	282	0	196	0
—Unit 10	407	165	407	0	0	0
—Unit 11	2,507	1,014	1,534	0	365	607
TOTAL Blackline Hawaiian Damselfly—Lowland Wet	25,203	10,198	8,043	4,562	956	11,640
Oceanic Hawaiian Damselfly—Lowland Mesic						
—Unit 1	247	100	12	0	0	235

TABLE 6B—CRITICAL HABITAT PROPOSED FOR 3 OAHU DAMSELFLY SPECIES—Continued

[Totals may not sum due to rounding]

Proposed critical habitat unit	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	City and county	Private
TOTAL Oceanic Hawaiian Damselfly—Lowland Mesic	247	100	12	0	0	235
Oceanic Hawaiian Damselfly—Lowland Wet						
—Unit 2	790	320	0	0	0	790
—Unit 3	1,790	724	1,501	0	0	289
—Unit 4	3,041	1,231	1,385	0	0	1,656
—Unit 5	15,728	6,365	2,921	4,510	148	8,148
—Unit 6	124	50	0	0	0	124
—Unit 7	124	50	0	0	124	0
—Unit 8	53	21	0	0	27	26
—Unit 9	161	65	13	52	96	0
—Unit 10	478	193	282	0	196	0
—Unit 11	407	165	407	0	0	0
—Unit 12	2,507	1,014	1,534	0	365	607
TOTAL Oceanic Hawaiian Damselfly—Lowland Wet	25,203	10,198	8,043	4,562	956	11,640
Oceanic Hawaiian Damselfly—Wet Cliff						
—Unit 13	151	61	151	0	0	0
—Unit 14	144	58	144	0	0	0
—Unit 15	4,649	1,881	1,666	5	1,280	1,698
TOTAL Oceanic Hawaiian Damselfly—Wet Cliff	4,944	2,000	1,961	5	1,280	1,698

TABLE 7A—SPECIES FOR WHICH CRITICAL HABITAT IS PROPOSED FOR DESIGNATION IN EACH ECOSYSTEM, AND SECTION 4(a)(3) EXEMPT AREAS

[See discussion below]

Species	Coastal	Lowland dry	Lowland mesic	Lowland wet	Montane wet	Dry cliff	Wet cliff	Critical habitat ac (ha)	Exempt from critical habitat ac (ha) under 4(a)(3)	Total critical habitat plus exempt ac (ha)
PLANTS										
Abutilon sandwicense			X[W]			X[W]		7,633 (3,089)	169 (68)	7,802 (3,157)
Achyranthes splendens var. *rotundata.*	X[W]	X[W]				X[W]		3,510 (1,423)	0 (0)	3,510 (1,423)
Adenophorus periens				X[K–H]			X[K–H]	30,147 (12,198)	0 (0)	30,147 (12,198)
Alectryon macrococcus			X[W, K–H]		X[W]	X[W]		9,968 (4,035)	169 (68)	10,137 (4,103)
Bidens amplectens	X[W]	X[W]						1,140 (461)	16 (7)	1,156 (468)
Bonamia menziesii		X[W]	X[W, K]			X[W]		9,780 (3,958)	583 (236)	10,363 (4,194)
Cenchrus agrimonioides			X[W]			X[W]		7,633 (3,089)	169 (68)	7,802 (3,157)
Centaurium sebaeoides	X[W, K]							1,275 (517)	0 (0)	1,275 (517)
Chamaesyce celastroides var. *kaenana.*	X[W]	X[W]	X[W, K–H]					8,971 (3,631)	53 (21)	9,024 (3,652)
Chamaesyce deppeana							X[K]	4,944 (2,000)	0 (0)	4,944 (2,000)
Chamaesyce herbstii			X[W]			X[W]		7,633 (3,089)	169 (68)	7,802 (3,157)
Chamaesyce kuwaleana	X[K–H]					X[W]		2,084 (844)	0 (0)	2,084 (844)
Chamaesyce rockii				X[K]			X[K]	30,147 (12,198)	5,254 (2,126)	35,401 (14,324)
Chamaesyce skottsbergii var. *skottsbergii.*		X[W]						548 (221)	0 (0)	548 (221)
Colubrina oppositifolia			X[W]					5,866 (2,374)	0 (0)	5,866 (2,374)
Ctenitis squamigera			X[W, K–H]					7,831 (3,170)	811 (328)	8,642 (3,498)
Cyanea acuminata			X[W, K]	X[W, K]	X[W]		X[W, K]	39,365 (15,929)	7,183 (2,906)	46,548 (18,835)
Cyanea calycina			X[W, K]	X[W, K]	X[W]		X[W, K]	39,365 (15,929)	6,588 (2,665)	45,953 (18,594)
Cyanea crispa			X[K]	X[K]			X[K]	32,112 (12,994)	5,306 (2,147)	37,418 (15,141)
Cyanea grimesiana ssp. *grimesiana.*			X[W, K]	X[W, K]				33,727 (13,649)	0 (0)	33,727 (13,649)
Cyanea grimesiana ssp. *obatae.*			X[W]	X[W]		X[W]		8,326 (3,370)	1,567 (634)	9,893 (4,004)
Cyanea humboldtiana				X[K]			X[K]	30,147 (12,198)	5,306 (2,147)	35,453 (14,345)
Cyanea koolauensis				X[K]				25,203 (10,198)	5,893 (2,385)	31,096 (12,583)
Cyanea lanceolata			X[K]	X[K]				27,168 (10,994)	5,298 (2,144)	32,466 (13,138)
Cyanea longiflora			X[W, K–H]					7,831 (3,170)	125 (51)	7,956 (3,221)
Cyanea pinnatifida			X[W–H]					5,866 (2,374)	0 (0)	5,866 (2,374)
Cyanea purpurellifolia				X[K]			X[K]	30,147 (12,198)	5,298 (2,144)	35,445 (14,342)
Cyanea st.-johnii				X[K]			X[K]	30,147 (12,198)	5,298 (2,144)	35,445 (14,342)
Cyanea superba			X[W]					5,866 (2,374)	693 (280)	6,559 (2,654)
Cyanea truncata			X[K]	X[K–H]			X[K–H]	32,112 (12,994)	0 (0)	32,112 (12,994)
Cyperus pennatiformis			X[W–H]					5,866 (2,374)	0 (0)	5,866 (2,374)
Cyperus trachysanthos	X[W, K]	X[W, K]						181 (74)	0 (0)	181 (74)

TABLE 7A—SPECIES FOR WHICH CRITICAL HABITAT IS PROPOSED FOR DESIGNATION IN EACH ECOSYSTEM, AND SECTION 4(a)(3) EXEMPT AREAS—Continued

[See discussion below]

Species	Coastal	Lowland dry	Lowland mesic	Lowland wet	Montane wet	Dry cliff	Wet cliff	Critical habitat ac (ha)	Exempt from critical habitat ac (ha) under 4(a)(3)	Total critical habitat plus exempt ac (ha)
Cyrtandra dentata			X[W, K]	X[W, K]		X[W]		38,995 (15,779)	5,468 (2,213)	44,463 (17,992)
Cyrtandra gracilis				X[K]				25,203 (10,198)	0 (0)	25,203 (10,198)
Cyrtandra kaulantha				X[K]			X[K]	30,147 (12,198)	0 (0)	30,147 (12,198)
Cyrtandra polyantha			X[K]	X[K]				27,168 (10,994)	0 (0)	27,168 (10,994)
Cyrtandra sessilis				X[K]			X[K]	30,147 (12,198)	0 (0)	30,147 (12,198)
Cyrtandra subumbellata				X[K]			X[K]	30,147 (12,198)	595 (241)	30,742 (12,439)
Cyrtandra viridiflora				X[K]			X[K]	30,147 (12,198)	5,306 (2,147)	35,453 (14,345)
*Cyrtandra waiolani**			X[K–H]	X[K–H]				27,168 (10,994)	0 (0)	27,168 (10,994)
Delissea subcordata			X[W, K–H]					7,831 (3,170)	693 (280)	8,524 (3,450)
Diellia erecta			X[K]					1,965 (796)	0 (0)	1,965 (796)
Diellia falcata			X[W, K–H]			X[W]		9,598 (3,885)	1,406 (569)	11,004 (4,454)
Diellia unisora			X[W]			X[W]		7,633 (3,089)	0 (0)	7,633 (3,089)
Diplazium molokaiense			X[W–H]	X[W–H]				6,559 (2,655)	0 (0)	6,559 (2,655)
Doryopteris takeuchii		X[K]						302 (122)	0 (0)	302 (122)
Dubautia herbstobatae			X[W]			X[W]		7,633 (3,089)	583 (236)	8,216 (3,325)
Eragrostis fosbergii			X[W]			X[W]		7,633 (3,089)	0 (0)	7,633 (3,089)
Eugenia koolauensis			X[W, K]					7,831 (3,170)	125 (51)	7,956 (3,221)
Euphorbia haeleeleana		X[W]	X[W]					6,048 (2,447)	53 (21)	6,101 (2,468)
Flueggea neowawraea			X[W]			X[W]		7,633 (3,089)	1,406 (569)	9,039 (3,658)
Gardenia mannii			X[W, K]	X[W, K]				33,727 (13,649)	5,298 (2,144)	39,025 (15,793)
Gouania meyenii		X[W, K–H]	X[W]			X[W]		8,117 (3,284)	0 (0)	8,117 (3,284)
Gouania vitifolia		X[W]	X[W–H]	X[W]		X[W]		8,508 (3,443)	0 (0)	8,508 (3,443)
Hesperomannia arborescens			X[W, K]	X[K]				33,034 (13,368)	5,298 (2,144)	38,332 (15,512)
Hesperomannia arbuscula			X[W]	X[W]				6,559 (2,655)	0 (0)	6,559 (2,655)
Hibiscus brackenridgei		X[W]	X[W]					6,048 (2,447)	18 (7)	6,066 (2,454)
Huperzia nutans				X[K]			X[K]	30,147 (12,198)	5,901 (2,388)	36,048 (14,586)
Isodendrion laurifolium			X[W, K–H]			X[W]		9,598 (3,885)	0 (0)	9,598 (3,885)
Isodendrion longifolium			X[W, K]	X[W, K]				33,727 (13,649)	595 (241)	34,322 (13,890)
Isodendrion pyrifolium		X[W–H]				X[W–H]		1,949 (788)	0 (0)	1,949 (788)
Kadua coriacea			X[W–H, K–H]					7,831 (3,170)	0 (0)	7,831 (3,170)
Kadua degeneri			X[W]			X[W]		7,633 (3,089)	170 (69)	7,803 (3,158)
Kadua parvula			X[W]			X[W]		7,633 (3,089)	583 (236)	8,216 (3,325)
Korthalsella degeneri						X[W]		1,767 (715)	412 (167)	2,179 (882)
Labordia cyrtandrae			X[W, K]	X[W, K]	X[W]		X[W, K]	39,365 (15,929)	7,183 (2,906)	46,548 (18,835)
Lepidium arbuscula						X[W]		1,767 (715)	690 (280)	2,457 (995)
Lipochaeta lobata var. *leptophylla.*						X[W]		1,767 (715)	0 (0)	1,767 (715)
Lobelia gaudichaudii ssp. *koolauensis.*				X[K]				25,203 (10,198)	595 (241)	25,798 (10,439)
Lobelia monostachya			X[K]					1,965 (796)	0 (0)	1,965 (796)
Lobelia niihauensis			X[W]			X[W]		7,633 (3,089)	583 (236)	8,216 (3,325)
Lobelia oahuensis				X[W, K]	X[W]		X[W, K]	31,210 (12,629)	642 (259)	31,852 (12,888)
Lysimachia filifolia							X[K]	4,944 (2,000)	0 (0)	4,944 (2,000)
Marsilea villosa	X[W, K]	X[W, K]						181 (74)	0 (0)	181 (74)
Melanthera tenuifolia		X[W]	X[W]			X[W]		7,815 (3,162)	753 (305)	8,568 (3,467)
Melicope christophersenii					X[W]		X[W]	694 (280)	481 (194)	1,175 (474)
Melicope hiiakae				X[K]				25,203 (10,198)	5,298 (2,144)	30,501 (12,342)
Melicope lydgatei			X[K]	X[K]				27,168 (10,994)	5,298 (2,144)	32,466 (13,138)
Melicope makahae			X[W]	X[W]		X[W]		8,326 (3,370)	583 (236)	8,909 (3,606)
Melicope pallida			X[W]					5,866 (2,374)	0 (0)	5,866 (2,374)
Melicope saint-johnii			X[W, K–H]			X[W]		9,598 (3,885)	0 (0)	9,598 (3,885)
Myrsine juddii				X[K]				25,203 (10,198)	5,298 (2,144)	30,501 (12,342)
Neraudia angulata		X[W]	X[W]			X[W]		7,815 (3,162)	1,406 (569)	9,221 (3,731)
Nototrichium humile		X[W]	X[W]			X[W]		7,815 (3,162)	193 (78)	8,008 (3,240)
Peucedanum sandwicense						X[W]		1,767 (715)	0 (0)	1,767 (715)
Phyllostegia hirsuta			X[W, K]	X[W, K]	X[W]		X[W, K]	39,365 (15,929)	7,183 (2,906)	46,548 (18,835)
Phyllostegia kaalaensis			X[W]			X[W]		7,633 (3,089)	0 (0)	7,633 (3,089)
Phyllostegia mollis			X[W, K–H]	X[W]				8,524 (3,451)	801 (324)	9,325 (3,775)
Phyllostegia parviflora var. *lydgatei.*			X[W–H]					5,866 (2,374)	0 (0)	5,866 (2,374)
Phyllostegia parviflora var. *parviflora.*			X[K–H]	X[K]			X[K]	32,112 (12,994)	0 (0)	32,112 (12,994)
Plantago princeps var. *longibracteata.*				X[K–H]				25,203 (10,198)	0 (0)	25,203 (10,198)
Plantago princeps var. *princeps.*			X[W, K–H]	X[W, K]		X[W]	X[K]	40,438 (16,364)	896 (352)	41,334 (16,716)
Platanthera holochila				X[K]				25,203 (10,198)	0 (0)	25,203 (10,198)
Platydesma cornuta var. *cornuta.*				X[K]				25,203 (10,198)	5,893 (2,385)	31,096 (12,583)
Platydesma cornuta var. *decurrens.*			X[W]			X[W]		7,633 (3,089)	1,406 (569)	9,039 (3,658)
Pleomele forbesii		X[W]	X[W, K]	X[W]		X[W]		10,473 (4,239)	753 (305)	11,226 (4,544)
Psychotria hexandra ssp. *oahuensis.*				X[K]			X[K]	30,147 (12,198)	5,306 (2,147)	35,453 (14,345)
Pteralyxia macrocarpa			X[W, K]	X[W, K]		X[W]	X[W, K]	40,762 (16,494)	1,174 (718)	42,536 (17,212)
Pteris lidgatei				X[K]				25,203 (10,198)	5,893 (2,385)	31,096 (12,583)

TABLE 7A—SPECIES FOR WHICH CRITICAL HABITAT IS PROPOSED FOR DESIGNATION IN EACH ECOSYSTEM, AND SECTION 4(a)(3) EXEMPT AREAS—Continued

[See discussion below]

Species	Coastal	Lowland dry	Lowland mesic	Lowland wet	Montane wet	Dry cliff	Wet cliff	Critical habitat ac (ha)	Exempt from critical habitat ac (ha) under 4(a)(3)	Total critical habitat plus exempt ac (ha)
Sanicula mariversa			X[W]			X[W]		7,633 (3,089)	583 (236)	8,216 (3,325)
Sanicula purpurea				X[K]			X[K]	30,147 (12,198)	5,901 (2,388)	36,048 (14,586)
Schiedea hookeri		X[W]	X[W]	X[W]		X[W]	X[W]	8,832 (3,573)	1,066 (431)	9,898 (4,004)
Schiedea kaalae			X[W, K]	X[W]			X[W, K]	13,792 (5,581)	883 (357)	14,675 (5,938)
Schiedea kealiae	X[W]	X[W]						1,140 (461)	0 (0)	1,140 (461)
Schiedea nuttallii			X[W, K–H]					7,831 (3,170)	864 (349)	8,695 (3,519)
Schiedea obovata			X[W]			X[W]		7,633 (3,089)	169 (68)	7,802 (3,157)
Schiedea trinervis					X[W]	X[W]	X[W]	2,461 (995)	494 (199)	2,955 (1,194)
Sesbania tomentosa	X[W, K]							1,275 (517)	0 (0)	1,140 (461)
Silene lanceolata						X[W]		1,767 (715)	412 (167)	2,179 (882)
Silene perlmanii			X[W]			X[W]		7,633 (3,089)	0 (0)	7,633 (3,089)
Solanum sandwicense			X[W–H, K–H]					7,831 (3,170)	640 (259)	8,471 (3,429)
Spermolepis hawaiiensis		X[W, K]				X[W]		2,251 (910)	0 (0)	2,251 (910)
Stenogyne kanehoana			X[W]					5,866 (2,374)	640 (259)	6,506 (2,633)
Tetramolopium filiforme						X[W]		1,767 (715)	412 (167)	2,179 (882)
Tetramolopium lepidotum ssp. *lepidotum.*			X[W]			X[W]		7,633 (3,089)	0 (0)	7,633 (3,089)
Tetraplasandra gymnocarpa			X[K]	X[K]			X[K]	32,112 (12,994)	125 (51)	32,237 (13,045)
Tetraplasandra lydgatei			X[K]					1,965 (796)	0 (0)	1,965 (796)
Trematolobelia singularis				X[K]			X[K]	30,147 (12,198)	0 (0)	30,147 (12,198)
Urera kaalae			X[W]	X[W]				6,559 (2,655)	0 (0)	6,559 (2,655)
Vigna o-wahuensis	X[W–H, K–H]							6,219 (2,517)	0 (0)	6,219 (2,517)
Viola chamissoniana ssp. *chamissoniana.*			X[W]			X[W]		7,633 (3,089)	583 (236)	8,216 (3,325)
Viola oahuensis				X[K]			X[K]	25,203 (10,198)	595 (241)	25,798 (10,439)
Zanthoxylum oahuense				X[K]				25,203 (10,198)	5,893 (2,385)	31,096 (12,583)
ANIMALS										
blackline Hawaiian damselfly				X[W–H, K]				25,203 (10,198)	5,893 (2,385)	31,096 (12,583)
crimson Hawaiian damselfly				X[W–H, K]			X[K]	30,147 (12,198)	5,901 (2,388)	36,048 (14,586)
oceanic Hawaiian damselfly			X[K]	X[W–H, K]			X[K]	30,394 (12,298)	5,306 (2,147)	35,700 (14,445)
Proposed CH ac (ha)	1,339 (542)	1,025 (413)	7,831 (3,170)	25,896 (10,479)	370 (150)	1,767 (715)	5,268 (2,130)			
Exempt Area ac (ha)	0 (0)	18 (7)	989 (400)	6,054 (2,450)	399 (161)	547 (222)	90 (36)			
Total Area Considered Proposed CH (including Exempt Area) ac (ha).	1,339 (542)	1,041 (421)	8,819 (3,569)	31,948 (12,929)	769 (311)	2,314 (937)	5,358 (2,168)			

W = occurs within indicated ecosystem in the Waianae Mountain caldera complex.
K = occurs within indicated ecosystem in the Koolau Mountain caldera complex.
W–H = known historically (last observed > 20 yrs ago) from indicated ecosystem in the Waianae Mountain caldera complex.
K–H = known historically (last observed > 20 yrs ago) from indicated ecosystem in the Koolau Mountain caldera complex.
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. Unoccupied habitat provides 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.

Note: Total number of species in table is greater than 124 because we identify the applicable ecosystems and section 4(A)(3) exempt areas for the Oahu varieties of *Phyllostegia parviflora* and *Plantago princeps.*

TABLE 7B—AREAS BY ECOSYSTEM DETERMINED TO BE EXEMPT FROM DESIGNATION UNDER SECTION 4(a)(3) OF THE ACT

Ecosystem	Proposed critical habitat		Acres (hectares) exempt from critical habitat		Total area considered	
	ac	ha	ac	ha	ac	ha
Coastal	1,339	542	0	0	1,339	542
Lowland Dry	1,025	413	18	7	1,041	421
Lowland Mesic	7,831	3,170	989	400	8,820	3,570
Lowland Wet	25,896	10,479	6,054	2,450	31,950	12,929
Montane Wet	370	150	399	161	769	311
Dry Cliff	1,767	715	547	222	2,314	937
Wet Cliff	5,268	2,130	90	36	4,739	1,917

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 the 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 124 Oahu species for which we are herein proposing to designate critical habitat.

The 124 Oahu species for which we are proposing to designate critical habitat include 116 species that are currently found in the wild on Oahu; 7 plant species found currently only on other Hawaiian Islands, but which were historically found on Oahu; and 1 plant species, *Cyrtandra waiolani,* which may not be extant in the wild. For each of the 123 species currently found in the wild, we have determined 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). As described earlier, in some cases, additional species-specific primary constituent elements were also identified (see Table 5). Special management considerations or protections are necessary throughout the critical habitat areas proposed here to avoid further degradation or destruction of 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 feral ungulates, competition with nonnative species, hurricanes, landslides, rockfalls, flooding, fire, drought, and climate change. The Hawaiian damselflies are additionally threatened by destruction and modification of their aquatic habitat due to conversion and fill for agriculture and development, and stream alterations (diversions, channelization, and dewatering). 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, except that in the coastal ecosystem on Oahu, requires active management to address the ongoing degradation and loss of native habitat caused by feral ungulates (pigs and goats). Feral 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 alien plant species into native habitats. Particular attention is required during 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 29 of the proposed ecosystem critical habitat units in particular: Oahu—Coastal—Unit 1, Oahu—Coastal—Unit 9, Oahu—Coastal—Unit 10, Oahu—Coastal—Unit 11, Oahu—Coastal—Unit 12, Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, Oahu—Coastal—Unit 15, Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 6, Oahu—Lowland Dry—Unit 7, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 7, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8. This threat is largely a result of the presence of nonnative plant species such as the grasses *Cenchrus ciliaris* and *Melinus 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).

Thirty-five of the proposed ecosystem critical habitat units (Oahu—Coastal—Unit 1, Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 6, Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8) 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 populations of 24 plants (e.g., *Cyanea grimesiana* ssp. *grimesiana, C. lanceolata, Cyrtandra dentata, C. kaulantha, C. sessilis, Doryopteris takeuchii, Huperzia nutans, Lobelia gaudichaudii* ssp. *koolauensis, Lysimachia filifolia, Melicope makahae, Phyllostegia hirsuta, P. mollis, P. parviflora* var. *lydgatei, Plantago princeps* var. *princeps, Platydesma cornuta* var. *cornuta, P. cornuta* var. *decurrens, Psychotria hexandra* ssp. *oahuensis, Sanicula mariversa, Schiedea kealiae, S. obovata, Solanum sandwicense, Spermolepis hawaiiensis, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana*) and 3 damselfly species found on steep slopes and cliffs, or in narrow gulches. In addition, perennial streams in 40 of the overlapping ecosystem units (blackline Hawaiian damselfly Lowland Wet units 1–11; crimson Hawaiian damselfly Lowland Wet units 1–11 and Wet Cliff units 12–14; and oceanic Hawaiian damselfly critical habitat units 1–Lowland Mesic, Lowland Wet units 2–12, and Wet Cliff units 13–15) may require special management to reduce the threats to the blackline, crimson, and oceanic Hawaiian damselflies from diversions, dewatering, vertical wells, and stream channelization.

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 124 Oahu species. 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 43,491 ac (17,600 ha) as critical habitat in 7 ecosystem types for 124 species. The proposed critical habitat is comprised of 66 critical habitat units for the plants, and 40 critical habitat units for the damselflies (see Tables 5A and 5B, above, for details). The proposed critical habitat includes land under State, City and County of Honolulu, Federal (Department of Defense—Navy; Department of Homeland Security—Coast Guard; Department of Interior—Fish and Wildlife Service), 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 124 species of plants and animals.

Descriptions of Proposed Critical Habitat Units

The unit descriptions presented here represent the 7 essential ecosystem areas that we have identified for all 124 species. Critical habitat for the 121 Oahu plant species and critical habitat for the 3 Oahu damselflies are published in separate sections of the Code of Federal Regulations (CFR); critical habitat is published in 50 CFR 17.99(i) for Oahu plants and in 50 CFR 17.95(i) for the three damselfly species. However, the same geographic area represents proposed critical habitat for both plants and damselflies in some portions of Oahu. For example, Oahu—Lowland Mesic—Unit 6 (represented by map 26 in our proposed revision to 50 CFR 17.99(i)) and oceanic Hawaiian damselfly—Unit 1—Lowland Mesic (represented by map 2 for this species in 50 CFR 17.95(i)) 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 costs and benefits of designating critical habitat, including information provided during the public comment period on potential economic impacts of this proposed critical habitat designation, and are made at the discretion of the Secretary. The consideration of potential economic impacts 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.

Oahu—Coastal—Unit 1 consists of 958 ac (388 ha) in the coastal ecosystem along the northwestern coast of Oahu from Kaena Point east to Kauhao Pali and southeast to Keawaula. This unit is State-owned, and partially within Kaena Point State Park. It is occupied by the plants *Achyranthes splendens* var. *rotundata, Chamaesyce celastroides* var. *kaenana,* and *Sesbania tomentosa,* and includes the mixed herbland and shrubland, the moisture regime, and 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 Oahu—Coastal—Unit 1 is not known to be occupied by *Bidens amplectens, Centaurium sebaeoides, Schiedea kealiae,* 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Coastal—Unit 2 consists of 12 ac (5 ha) in the coastal ecosystem on Mokuaula, an islet east of Kalanai Point on the northeastern coast of Oahu. This unit is State-owned and is classified as a State Seabird Sanctuary. It includes the mixed herbland and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although this unit is not currently occupied by *Centaurium sebaeoides, Chamaesyce kuwaleana, 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 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.

Oahu—Coastal—Unit 3 consists of 15 ac (6 ha) in the coastal ecosystem, on the larger of two islets (Moku Manu) off the windward coast of Oahu near Mokapu Peninsula. This unit is State-owned, classified as a State Seabird Sanctuary, and includes the mixed herbland and shrubland, the moisture regime, and subcanopy and understory native plant species identified as PCEs in the coastal ecosystem (see Table 4). Although this unit is not currently occupied by *Centaurium sebaeoides, Chamaesyce kuwaleana, 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 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.

Oahu—Coastal—Unit 4 consists of 3 ac (1 ha) in the coastal ecosystem, the smaller of two islets (Moku Manu) off the windward coast Oahu near Mokapu Peninsula. This unit is State-owned, classified as a State Seabird Sanctuary, and includes the mixed herbland and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although Oahu—Coastal—Unit 4 is not currently occupied by *Centaurium sebaeoides, Chamaesyce kuwaleana, 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 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.

Oahu—Coastal—Unit 5 consists of 12 ac (5 ha) in the coastal ecosystem, the larger of two islands (Mokulua Islands) off the windward coast of Oahu near Wailea Point. This unit is State-owned, classified as a State Seabird Sanctuary, and includes the mixed herbland and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although this unit is not currently occupied by *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Coastal—Unit 6 consists of 9 ac (4 ha) in the coastal ecosystem, on the smaller of two islands (Mokulua Islands) off the windward coast of Oahu near Wailea Point. This unit is State-owned, classified as a State Seabird Sanctuary, and includes the mixed herbland and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although Oahu—Coastal—Unit 6 is not currently occupied by *Centaurium sebaeoides, Chamaesyce kuwaleana, 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 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.

Oahu—Coastal—Unit 7 consists of 67 ac (27 ha) in the coastal ecosystem, on the larger of two islands (Manana Island) off the windward coast of Oahu near Makapuu Point. This unit is State-owned, classified as a State Seabird Sanctuary, and includes the mixed herbland and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although Oahu—Coastal—Unit 7 is not currently occupied by *Centaurium sebaeoides, Chamaesyce kuwaleana, 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 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.

Oahu—Coastal—Unit 8 consists of 10 ac (4 ha) in the coastal ecosystem, on the smaller of two islands (Kaohikaipu Island) off the windward coast of Oahu near Makapuu Point. This unit is State-owned, classified as a State Seabird Sanctuary, and includes the mixed herbland and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit is occupied by the plant *Sesbania tomentosa* 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 Oahu—Coastal—Unit 8 is not currently occupied by *Centaurium sebaeoides, Chamaesyce kuwaleana,* and *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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Coastal—Unit 9 consists of 84 ac (34 ha) of State land and 0.02 ac (0.01 ha) of privately owned land in the coastal ecosystem on the leeward side of Makapuu Point (Puuokipahulu). This unit is occupied by the plants *Cyperus trachysanthos* and *Marsilea villosa,* and includes the mixed herbland and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the coastal ecosystem, as well as the unique species PCEs for the plants *C. trachysanthos* and *M. villosa* (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 Oahu—Coastal—Unit 9 is not currently occupied by *Centaurium sebaeoides, Chamaesyce kuwaleana, 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 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.

Oahu—Coastal—Unit 10 consists of 74 ac (30 ha) in the coastal ecosystem, owned by the City and County of Honolulu at Halona Point on the leeward side of Koko Crater, extending from Sandy Beach to Kahauloa. It is occupied by the plant *Centaurium sebaeiodes* and includes the mixed herbland and shrubland, the moisture regime, and 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 Oahu—Coastal—Unit 10 is not known to be occupied by *Chamaesyce kuwaleana, Sesbania tomentosa,* and *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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Coastal—Unit 11 consists of 20 ac (8 ha) of City and County of Honolulu land in the coastal ecosystem, at Ihiihilauakea on Koko Head (Kaihuokapuaa). This unit is occupied by the plant *Marsilea villosa,* and includes the mixed herbland and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the coastal ecosystem, as well as the unique species PCEs for this species (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 Oahu—Coastal—Unit 11 is not currently occupied by *Centaurium sebaeoides, Chamaesyce kuwaleana, Cyperus trachysanthos, Sesbania tomentosa,* and *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, these species require suitable habitat and space for expansion or reintroduction to achieve

population levels that could achieve recovery.

Oahu—Coastal—Unit 12 consists of 11 ac (5 ha) of City and County land in the coastal ecosystem, at Nonoula on Koko Head (Kaihuokapuaa). This unit is occupied by the plant *Marsilea villosa,* and includes the mixed herbland and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the coastal ecosystem, as well as the unique species PCEs for this species (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 Oahu—Coastal—Unit 12 is not currently occupied by *Centaurium sebaeoides, Chamaesyce kuwaleana, Cyperus trachysanthos, 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 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.

Oahu—Coastal—Unit 13 consists of 24 ac (10 ha) in the coastal ecosystem, on City, County and private land at Kalaeloa. This unit is occupied by the plant *Achyranthes splendens* var. *rotundata,* and includes the mixed herbland and shrubland, the moisture regime, and 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 Oahu—Coastal—Unit 13 is not known to be occupied by *Bidens amplectens, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Schiedea kealiae, Sesbania tomentosa,* and *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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Coastal—Unit 14 consists of 4 ac (2 ha) in the coastal ecosystem, on private and federal (U.S. Coast Guard) land at Kalaeloa. This unit is occupied by the plant *Achyranthes splendens* var. *rotundata,* and includes the mixed herbland and shrubland, the moisture regime, and 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 Oahu—Coastal—Unit 14 is not known to be occupied by *Bidens amplectens, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Schiedea kealiae, Sesbania tomentosa,* and *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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Coastal—Unit 15 consists of 34 ac (14 ha) in the coastal ecosystem, on State, private, and federal (Pearl Harbor NWR) land at Kalaeloa. This unit is occupied by the plant *Achyranthes splendens* var. *rotundata,* and includes the mixed herbland and shrubland, the moisture regime, and 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 Oahu—Coastal—Unit 15 is not known to be occupied by *Bidens amplectens, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Schiedea kealiae, 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 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.

Oahu—Lowland Dry—Unit 1 consists of 102 ac (41 ha) in the lowland dry ecosystem, on State and privately owned land in the Waianae Mountains, extending from Haili Gulch to Kawaipahai. This unit is occupied by the plants *Bidens amplectens, Hibiscus brackenridgei, Nototrichium humile,* and *Schiedea kealiae,* and includes the dry forest 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 Oahu—Lowland Dry—Unit 1 is not known to be occupied by the plants *Achyranthes splendens* var. *rotundata, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Pleomele forbesii, Schiedea hookeri,* or *Spermolepis hawaiiensis,* 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 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.

Oahu—Lowland Dry—Unit 2 consists of 29 ac (12 ha) in the lowland dry ecosystem in the Waianae Mountains, on State-owned land within Kaena Point State Park. This unit is occupied by the plants *Bonamia menziesii, Melanthera tenuifolia, Nototrichium humile,* and *Pleomele forbesii,* and includes the dry forest 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 Oahu—Lowland Dry—Unit 2 is not known to be occupied by the plants *Achyranthes splendens* var. *rotundata, Bidens amplectens, Chamaesyce celastroides* var. *kaenana, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Neraudia, Schiedea hookeri, S. kealiae,* or *Spermolepis hawaiiensis,* 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 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.

Oahu—Lowland Dry—Unit 3 consists of 25 ac (10 ha) in the lowland dry ecosystem in the Waianae Mountains, on Federal land (U.S. Navy) in Lualualei Valley, south of Mailiili Stream. This unit is occupied by the plant *Marsilea villosa,* and includes the dry forest and shrubland, the moisture regime, and canopy, subcanopy and understory native plant species identified as physical or biological features in the lowland dry ecosystem, as well as unique PCEs for this species (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 Oahu—Lowland Dry—Unit 3 is not known to be occupied by the plants *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Cyperus trachysanthos, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neruadia angulata* var. *angulata, N. angulata* var. *dentata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, S. kealiae,* or *Spermolepis hawaiiensis,* 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 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.

Oahu—Lowland Dry—Unit 4 consists of 18 ac (7 ha) in the lowland dry ecosystem in the Waianae Mountains, on Federal land (U.S. Navy) in Lualualei Valley, along Paakea Road. This unit is occupied by the plant *Marsilea villosa,* and includes the dry forest and shrubland, the moisture regime, and canopy, subcanopy and understory native plant species identified as physical or biological features in the lowland dry ecosystem, as well as unique PCEs for this plant (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 Oahu—Lowland Dry—Unit 4 is not known to be occupied by the plants *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Cyperus trachysanthos, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, S. kealiae,* or *Spermolepis hawaiiensis,* 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 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.

Oahu—Lowland Dry—Unit 5 consists of 8 ac (3 ha) in the lowland dry ecosystem in the Waianae Mountains, on Federal land (U.S. Navy) in Lualualei Valley, northeast of Paakea Road. This unit is occupied by the plant *Cyperus trachysanthos* and includes the dry forest and shrubland, the moisture regime, and canopy, subcanopy and understory native plant species identified as physical or biological features in the lowland dry ecosystem, as well as unique PCEs for this plant (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 Oahu—Lowland Dry—Unit 5 is not known to be occupied by the plants *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Marsilea villosa, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, S. kealiae,* or *Spermolepis hawaiiensis,* 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 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.

Oahu—Lowland Dry—Unit 6 consists of 287 ac (116 ha) of State land in the lowland dry ecosystem, on the outer rim of Leahi (Diamond Head) Crater within Diamond Head State Monument. This unit is occupied by the plants *Doryopteris takeuchii* and *Spermolepis hawaiiensis,* and includes the dry forest 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 Oahu—Lowland Dry—Unit 6 is not known to be occupied by the plant *Gouania meyenii,* we have determined this area to be essential for the conservation and recovery of this lowland dry species because it provides the PCEs necessary for the reestablishment of wild populations within the historical ranges of the species. 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 achieve recovery.

Oahu—Lowland Dry—Unit 7 consists of 15 ac (6 ha) of State land in the lowland dry ecosystem, in Leahi (Diamond Head) Crater within Diamond Head State Monument. This unit is occupied by the plant *Cyperus trachysanthos* and includes the dry forest and shrubland, the moisture regime, and canopy, subcanopy and understory native plant species identified as physical or biological features in the lowland dry ecosystem, as well as unique PCEs for this plant (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 Oahu—Lowland Dry—Unit 7 is not known to be occupied by the plants *Doryopteris takeuchii, Gouania meyenii, Marsilea villosa,* or *Spermolepis hawaiiensis,* 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 the historical ranges of the

species, and the unique PCEs for the species *M. villosa.* 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.

Oahu—Lowland Dry—Unit 8 consists of 292 ac (118 ha) of State and private land in the lowland dry ecosystem, at Barbers Point Harbor. Although Oahu—Lowland Dry—Unit 8 is not known to be occupied by the plants *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, C. skottsbergii* var. *skottsbergii, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, S. kealiae,* or *Spermolepis hawaiiensis,* 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 the historical ranges of the species, and the unique PCEs for the species *C. skottsbergii* var. *skottsbergii.* 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.

Oahu—Lowland Dry—Unit 9 consists of 40 ac (16 ha) of City and County, State, private, and federal (Pearl Harbor NWR) land in the lowland dry ecosystem at Kalaeloa. This unit is occupied by the plant *Achyranthes splendens* var. *rotundata,* and includes the dry forest 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 Oahu—Lowland Dry—Unit 9 is not known to be occupied by the plants *Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, C. skottsbergii* var. *skottsbergii, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, S. kealiae,* or *Spermolepis hawaiiensis,* 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 the historical ranges of the species, and the unique PCEs for the species *C. skottsbergii* var. *skottsbergii.* 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.

Oahu—Lowland Dry—Unit 10 consists of 43 ac (17 ha) of State land (Department of Hawaiian Homelands (DHHL)) in the lowland dry ecosystem at Kalaeloa. This unit is occupied by the plant *Chamaesyce skottsbergii* var. *skottsbergii* and includes the dry forest and shrubland, the moisture regime, and canopy, subcanopy and understory native plant species identified as physical or biological features in the lowland dry ecosystem, as well as unique PCEs for this plant (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 DHHL Lowland Dry—Unit 10 is not known to be occupied by the plants *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, S. kealiae,* or *Spermolepis hawaiiensis,* 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 the historical ranges of the species, and the unique PCEs for the species *C. skottsbergii* var. *skottsbergii.* 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.

Oahu—Lowland Dry—Unit 11 consists of 166 ac (67 ha) of federal land (U.S. Navy) in the lowland dry ecosystem, at Kalaeloa. This unit is occupied by the plant *Chamaesyce skottsbergii* var. *skottsbergii* and includes the dry forest and shrubland, the moisture regime, and canopy, subcanopy and understory native plant species identified as physical or biological features in the lowland dry ecosystem, as well as unique PCEs for this plant (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 Oahu—Lowland Dry—Unit 11 is not known to be occupied by the plants *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, S. kealiae,* or *Spermolepis hawaiiensis,* 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 the historical ranges of the species, and the unique PCEs for the species *C. skottsbergii* var. *skottsbergii.* 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.

Oahu—Lowland Mesic—Unit 1 consists of 4,450 ac (1,801 ha) in the lowland mesic ecosystem in the Waianae Mountains, encompassing a large area including the north slopes of Mt. Kaala, from the Pahole Natural Area Reserve (NAR) to the Kaala NAR, and south to the Waianae Kai Forest Reserve (FR), on State, City and County of Honolulu, and privately owned land. This unit is occupied by the plants *Abutilon sandwicense, Alectryon macrococcus* var. *macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea acuminata, C. calycina, C. grimesiana* ssp. *grimesiana, C. grimesiana* ssp. *obatae, C. longiflora, C. superba, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Dubautia herbstobatae, Eragrostis fosbergii, Euphorbia haeleeleana, Flueggea neowawraea, Hesperomannia arborescens, H. arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, I. longifolium, Kadua degeneri, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, M. pallida, Neraudia angulata, Nototrichium humile, Phyllostegia kaalaensis, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea hookeri, S. kaalae, S. nuttallii, S. obovata,* and

Viola chamissoniana ssp. *chamissoniana,* and includes the mesic forest 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 Oahu—Lowland Mesic—Unit 1 is not known to be occupied by the plants *Chamaesyce celastroides* var. *kaenana, Cyanea pinnatifida, Cyperus pennatiformis, Diellia unisora, Diplazium molokaiense, Eugenia koolauensis, Gardenia mannii, Gouania meyenii, G. vitifolia,, Kadua coriacea, K. parvula, Labordia cyrtandrae, Melicope saint-johnii, Phyllostegia hirsuta, P. mollis, P. parviflora* var. *lydgatei, Plantago princeps* var. *princeps, Sanicula mariversa, Silene perlmanii, Solanum sandwicense, Stenogyne kanehoana, Tetramolopium lepidotum* ssp. *lepidotum,* or *Urera kaalae,* 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 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.

Oahu—Lowland Mesic—Unit 2 consists of 1,063 ac (430 ha) in the lowland mesic ecosystem on the windward side of the Waianae Mountains, from Puuhapapa south to Puukaua. This area was part of the Honouliuli Preserve, managed by The Nature Conservancy of Hawaii, and was recently acquired by the State. This unit is occupied by the plants *Abutilon sandwicense, Alectryon macrococcus, Cenchrus agrimonioides, Chamaesyce herbstii, Cyanea calycina, C. grimesiana* ssp. *obatae, Delissea subcordata, Diellia falcata, Gardenia mannii, Phyllostegia hirsuta, P. kaalaensis, P. mollis, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea hookeri, S. kaalae, Solanum sandwicense, Stenogyne kanehoana,* and *Urera kaalae,* and includes the mesic forest 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 Oahu—Lowland Mesic—Unit 2 is not known to be occupied by the plants *Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Colubrina oppositifolia, Ctenitis squamigera, Cyanea acuminata, C. grimesiana* ssp. *grimesiana, C. longiflora, C. pinnatifida, C. superba, Cyperus pennatiformis, Cyrtandra dentata, Diellia unisora, Diplazium molokaiense, Dubautia herbstobatae, Eragrostis fosbergii, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gouania meyenii, G. vitifolia, Hesperomannia arborescens, H. arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, I. longifolium, Kadua coriacea, K. degeneri, K. parvula, Labordia cyrtandrae, Lobelia niihauense, Melanthera tenuifolia, Melicope makahae, M. pallida, M. saint-johnii, Neraudia angulata, Nototrichium humile, Phyllostegia parviflora* var. *lydgatei, Plantago princeps* var. *princeps, Sanicula mariversa, Schiedea nuttallii, S. obovata, Silene perlmanii, Tetramolopium lepidotum* ssp. *lepidotum,* or *Viola chamissoniana* ssp. *chamissoniana,* 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 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.

Oahu—Lowland Mesic—Unit 3 consists of 353 ac (143 ha) in the lowland mesic ecosystem on the windward side of the Waianae Mountains, from Pohakea Pass to Kaiakuakai Gulch. This area was part of the Honouliuli Preserve, managed by The Nature Conservancy of Hawaii, and was recently acquired by the State. This unit is occupied by the plants *Alectryon macrococcus* var. *macrococcus, Cenchrus agrimonioides, Delissea subcordata, Diellia falcata, D. unisora, Hesperomannia arbuscula, Melicope saint-johnii, Phyllostegia mollis, P. parviflora* var. *lydgatei, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea kaalae, Silene perlmanii,* and *Urera kaalae,* and includes the mesic forest 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 Oahu—Lowland Mesic—Unit 3 is not known to be occupied by the plants *Abutilon sandwicense, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, C. herbstii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea acuminata, C. calycina, C. grimesiana* ssp. *grimesiana, C. grimesiana* ssp. *obatae, C. longiflora, C. pinnatifida, C. superba, Cyperus pennatiformis, Cyrtandra dentata, Diplazium molokaiense, Dubautia herbstobatae, Eragrostis fosbergii, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gardenia mannii, Gouania meyenii, G. vitifolia, Hesperomannia arborescens, Hibiscus brackenridgei, Isodendrion laurifolium, I. longifolium, Kadua coriacea, K. degeneri, K. parvula, Labordia cyrtandrae, Lobelia niihauense, Melanthera tenuifolia, Melicope makahae, M. pallida, Neraudia angulata, Nototrichium humile, Phyllostegia hirsuta, P. kaalaensis, Platydesma cornuta* var. *decurrens, Sanicula mariversa, Schiedea hookeri, S. nuttallii, S. obovata, Solanum sandwicense, Stenogyne kanehoana, Tetramolopium lepidotum* ssp. *lepidotum,* or *Viola chamissoniana* ssp. *chamissoniana,* 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 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.

Oahu—Lowland Mesic—Unit 4 consists of 20 ac (8 ha) in the lowland mesic ecosystem on the windward side of the Koolau Mountains, between the Waipilopilo and Hanaimoa gulches, on State-owned land within the Hauula Forest Reserve. This unit includes the lowland mesic forest 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 Oahu—Lowland Mesic—Unit 4 is not known to be occupied by the plants

Alectryon macrococcus, Bonamia menziesii, Chamaesyce celastroides var. *kaenana, Ctenitis squamigera, Cyanea acuminata, C. calycina, C. crispa, C. grimesiana* ssp. *grimesiana, C. lanceolata, C. longiflora, C. truncata, Cyrtandra dentata, C. polyantha, C. waiolani, Delissea subcordata, Diellia erecta, D. falcata, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Isodendrion laurifolium, I. longifolium, Kadua coriacea, Labordia cyrtandrae, Lobelia monostachya, Melicope lydgatei, M. saint-johnii, Phyllostegia hirsuta, P. mollis, P. parviflora* var. *parviflora, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea kaalae, S. nuttallii, Solanum sandwicense, Tetraplasandra gymnocarpa,* or *T. lydgatei,* 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 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.

Oahu—Lowland Mesic—Unit 5 consists of 29 ac (12 ha) in the lowland mesic ecosystem on the windward side of the Koolau Mountains, in Maakua Gulch and ridge; is State-owned; and is within the Hauula FR. This unit includes the mesic forest 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 Oahu—Lowland Mesic—Unit 5 is not known to be occupied by the plants *Alectryon macrococcus s, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Ctenitis squamigera, Cyanea acuminata, C. calycina, C. crispa, C. grimesiana* ssp. *grimesiana, C. lanceolata, C. longiflora, C. truncata, Cyrtandra dentata, C. polyantha, C. waiolani, Delissea subcordata, Diellia erecta, D. falcata, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Isodendrion laurifolium, I. longifolium, Kadua coriacea, Labordia cyrtandrae, Lobelia monostachya, Melicope lydgatei, M. saint-johnii, Phyllostegia hirsuta, P. mollis, P. parviflora* var. *parviflora, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea kaalae, S. nuttallii, Solanum sandwicense, Tetraplasandra gymnocarpa,* or *T. lydgatei,* 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 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.

Oahu—Lowland Mesic—Unit 6 (and) Oceanic Hawaiian damselfly—Unit 1—Lowland Mesic

This area consists of 247 ac (100 ha) in the lowland mesic ecosystem on the windward side of the Koolau Mountains, inland of Kaaawa Point, on State and privately owned land, and is partially within Ahupuaa O Kahana State Park. This area is occupied by the plants *Cyanea acuminata, C. crispa, C. truncata, Gardenia mannii, Pteralyxia macrocarpa,* and *Schiedea kaalae;* and the invertebrate, the oceanic Hawaiian damselfly. This area includes the lowland mesic forest and shrubland, the moisture regime, and canopy, subcanopy and understory native plant species identified as physical or biological features in the lowland mesic ecosystem, as well as unique PCEs for the damselfly (see Table 4). Because the streams and upland foraging and cover areas required by the oceanic Hawaiian damselfly are dispersed in the lowland mesic ecosystem, the lowland mesic ecosystem physical or biological features are essential to the damselfly because they provide for the proper ecological functioning of this ecosystem. This area 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 this area is not known to be occupied by the plants *Alectryon macrococcus, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Ctenitis squamigera, Cyanea calycina, C. grimesiana* ssp. *grimesiana, C. lanceolata, C. longiflora, Cyrtandra dentata, C. polyantha, C. waiolani, Delissea subcordata, Diellia erecta, D. falcata, Eugenia koolauensis, Hesperomannia arborescens, Isodendrion laurifolium, I. longifolium, Kadua coriacea, Labordia cyrtandrae, Lobelia monostachya, Melicope lydgatei, M. saint-johnii, Phyllostegia hirsuta, P. mollis, P. parviflora* var. *parviflora, Plantago princeps* var. *princeps, Pleomele forbesii, Schiedea nuttallii, Solanum sandwicense, Tetraplasandra gymnocarpa,* or *T. lydgatei,* 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 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.

Oahu—Lowland Mesic—Unit 7 consists of 1,669 ac (676 ha) in the lowland mesic ecosystem on the leeward side of the Koolau Mountains, on State and privately owned land, on Waialae Nui ridge. This unit is occupied by the plants *Bonamia menziesii, Cyanea acuminata, C. grimesiana* ssp. *grimesiana, C. lanceolata, Cyrtandra polyantha, Diellia erecta, Lobelia monostachya, Pleomele forbesii, Pteralyxia macrocarpa,* and *Tetraplasandra lydgatei,* and includes the mesic forest 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 this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Oahu—Lowland Mesic—Unit 7 is not known to be occupied by the plants *Alectryon macrococcus, Chamaesyce celastroides* var. *kaenana, Ctenitis squamigera, Cyanea calycina, C. crispa, C. longiflora, C. truncata, Cyrtandra dentata, C. waiolani, Delissea subcordata, Diellia falcata, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Isodendrion laurifolium, I. longifolium, Kadua coriacea, Labordia cyrtandrae, Melicope lydgatei, M. saint-johnii, Phyllostegia hirsuta, P. mollis, P. parviflora* var. *parviflora, Plantago princeps* var. *princeps, Schiedea kaalae, S. nuttallii, Solanum sandwicense,* or *Tetraplasandra gymnocarpa,* 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 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.

Oahu—Lowland Wet—Unit 1 consists of 541 ac (219 ha) owned by the State of Hawaii and City and County of Honolulu, in the lowland wet ecosystem on the windward side of the Waianae

Mountains, and partially within the Mokuleia and Waianae Kai Forest Reserves. This unit is occupied by the plants *Gouania vitifolia, Melicope makahae, Pleomele forbesii, Schiedea hookeri,* and *Urera kaalae,* and includes the wet forest 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 Oahu—Lowland Wet—Unit 1 is not known to be occupied by the plants *Cyanea acuminata, C. calycina, C. grimesiana* ssp. *grimesiana, C. grimesiana* ssp. *obatae, Cyrtandra dentata, Diplazium molokaiense, Gardenia mannii, Hesperomannia arbuscula, Isodendrion longifolium, Labordia cyrtandrae, Lobelia oahuensis, Phyllostegia hirsuta, P. mollis, Plantago princeps* var. *princeps, Pterlyxia macrocarpa,* or *Schiedea kaalae,* 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 2 consists of 20 ac (8 ha) in the lowland wet ecosystem on the windward side of the Waianae Mountains at Puuhapapa. This area was part of the Honouliuli Preserve, managed by The Nature Conservancy of Hawaii, and was recently acquired by the State. This unit is occupied by the plants *Phyllostegia hirsuta, P. mollis,* and *Urera kaalae,* and includes the wet forest 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 Oahu—Lowland Wet—Unit 2 is not known to be occupied by the plants *Cyanea acuminata, C. calycina, C. grimesiana* ssp. *grimesiana, C. grimesiana* ssp. *obatae, Cyrtandra dentata, Diplazium molokaiense, Gardenia mannii, Gouania vitifolia, Hesperomannia arbuscula, Isodendrion longifolium, Labordia cyrtandrae, Lobelia oahuensis, Melicope makahae, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea hookeri,* or *S. kaalae,* 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 3 consists of 29 ac (12 ha) in the lowland wet ecosystem on the windward side of the Waianae Mountains at Puukanehoa. This area was part of the Honouliuli Preserve, managed by The Nature Conservancy of Hawaii, and was recently acquired by the State. This unit is occupied by the plants *Phyllostegia hirsuta, P. mollis,* and *Schiedea hookeri,* and includes the wet forest 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 Oahu—Lowland Wet—Unit 3 is not known to be occupied by the plants *Cyanea acuminata, C. calycina, C. grimesiana* ssp. *grimesiana, C. grimesiana* ssp. *obatae, Cyrtandra dentata, Diplazium molokaiense, Gardenia mannii, Gouania vitifolia, Hesperomannia arbuscula, Isodendrion longifolium, Labordia cyrtandrae, Lobelia oahuensis, Melicope makahae, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea kaalae,* or *Urera kaalae,* 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 4 consists of 27 ac (11 ha) in the lowland wet ecosystem on the windward side of the Waianae Mountains on State land at Puukaua. A portion of this area was part of the Honouliuli Preserve, managed by The Nature Conservancy of Hawaii, and was recently acquired by the State. This unit is occupied by the plant *Phyllostegia mollis* and includes the wet forest 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. Although Oahu—Lowland Wet—Unit 4 is not known to be occupied by the plants *Cyanea acuminata, C. calycina, C. grimesiana* ssp. *grimesiana, C. grimesiana* ssp. *obatae, Cyrtandra dentata, Diplazium molokaiense, Gardenia mannii, Gouania vitifolia, Hesperomannia arbuscula, Isodendrion longifolium, Labordia cyrtandrae, Lobelia oahuensis, Melicope makahae, Phyllostegia hirsuta, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea hookeri, S. kaalae,* or *Urera kaalae,* 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 5 consists of 74 ac (29 ha) owned by the State of Hawaii and 2 ac (1 ha) of Federal land owned by the U.S. Navy (Lualualei) in the lowland wet ecosystem, on the windward side of the Waianae Mountains at Palikea. A portion of this area was part of the Honouliuli Preserve, managed by The Nature Conservancy of Hawaii, and was recently acquired by the State. This unit is occupied by the plants *Cyanea calycina, C. grimesiana* ssp. *obatae, Hesperomannia arbuscula,* and *Schiedea kaalae,* and includes the wet forest 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. Although Oahu—Lowland Wet—Unit 5 is not known to be

occupied by the plants *Cyanea acuminata, C. grimesiana* ssp. *grimesiana, Cyrtandra dentata, Diplazium molokaiense, Gardenia mannii, Gouania vitifolia, Isodendrion longifolium, Labordia cyrtandrae, Lobelia oahuensis, Melicope makahae, Phyllostegia hirsuta, P. mollis, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea hookeri,* or *Urera kaalae,* 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 6 (and) Blackline Hawaiian damselfly—Unit 1—Lowland Wet (and) Crimson Hawaiian damselfly—Unit 1—Lowland Wet (and) Oceanic Hawaiian damselfly—Unit 2—Lowland Wet

This area consists of 790 ac (320 ha) in the lowland wet ecosystem, on privately owned land on the windward side of the Koolau Mountains, and includes Kahawainui, Ihiihi, Wailele, and Koloa gulches. This area is occupied by the plant *Hesperomannia arborescens* and by the blackline and oceanic Hawaiian damselflies, and includes the wet forest and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the lowland wet ecosystem, as well as unique PCEs for the Hawaiian damselflies (see Table 4). Because the streams and upland foraging and cover areas required by the blackline and oceanic Hawaiian damselflies are dispersed in the lowland wet ecosystem, the lowland wet ecosystem physical or biological features are essential to the damselfly species because they provide for the proper ecological functioning of this ecosystem. This area 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 this area is not currently occupied by *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, C. calycina, C. crispa, C. grimesiana* ssp. *grimesiana, C. humboldtiana, C. koolauensis, C. lanceolata, C. purpurellifolia, C. st.-johnii, C. truncata, Cyrtandra dentata, C. gracilis, C. kaulantha, C. polyantha, C. sessilis, C. subumbellata, C. viridiflora, C. waiolani, Gardenia mannii, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, L. oahuensis, Melicope hiiakae, M. lydgatei, Myrsine juddii, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, P. princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis, Zanthoxylum oahuense,* or the crimson Hawaiian damselfly, 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 7 (and) Blackline Hawaiian damselfly—Unit 2—Lowland Wet (and) Crimson Hawaiian damselfly—Unit 2—Lowland Wet (and) Oceanic Hawaiian damselfly—Unit 3—Lowland Wet

This area consists of 1,790 ac (724 ha) in the lowland wet ecosystem on the windward side of the Koolau Mountains, on State and privately owned land within the Kaipapau and Haula Forest Reserves and Sacred Falls State Park, from Puukainapuaa to Kaluanui (Sacred Falls). This unit is occupied by the plants *Chamaesyce rockii, Cyanea acuminata, C. calycina, C. humboldtiana, C. purpurellifolia, C. truncata, Cyrtandra viridiflora, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Myrsine juddii, Phyllostegia hirsuta, Platydesma cornuta* var. *cornuta, Pteralyxia macrocarpa, Pteris lidgatei, Tetraplasandra gymnocarpa, Viola oahuensis,* and *Zanthoxylum oahuense,* and by the blackline and oceanic Hawaiian damselflies. This unit includes the wet forest and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the lowland wet ecosystem, as well as unique PCEs for the Hawaiian damselflies (see Table 4). Because the streams and upland foraging and cover areas required by the blackline and oceanic Hawaiian damselflies are dispersed in the lowland wet ecosystem, the lowland wet ecosystem physical or biological features are essential to the damselfly species because they provide for the proper ecological functioning of this ecosystem. The streams, foraging areas, and cover areas that are occupied contain the essential PCEs, and the streams and upland areas that are not occupied are essential to the conservation of the species because they support the proper ecological functioning of the occupied areas within the ecosystem. This area 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 this area is not currently occupied by *Adenophorus periens, Cyanea crispa, C. grimesiana* ssp. *grimesiana, C. koolauensis, C. lanceolata, C. st.-johnii, Cyrtandra dentata, C. gracilis, C. kaulantha, C. polyantha, C. sessilis, C. subumbellata, C. waiolani, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, L. oahuensis, Melicope hiiakae, M. lydgatei, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, P. princeps* var. *princeps, Platanthera holochila, Psychotria hexandra* ssp. *oahuensis, Sanicula purpurea, Trematolobelia singularis,* or the crimson Hawaiian damselfly, 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 8 (and) Blackline Hawaiian damselfly—Unit 3—Lowland Wet (and) Crimson Hawaiian damselfly—Unit 3—Lowland Wet (and) Oceanic Hawaiian damselfly—Unit 4—Lowland Wet

This area consists of 3,041 ac (1,231 ha) in the lowland wet ecosystem on the windward side of the Koolau Mountains, on State and private land partially within the Ahupuaa O Kahana State Park, including Waihoi Springs, and Punaluu, Kahana, Waikane, Waikeekee, and Uwao streams. This area is occupied by the plant *Cyrtandra kaulantha* and by the invertebrates, the blackline and crimson Hawaiian damselflies. This area includes the wet forest and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the

lowland wet ecosystem, as well as unique PCEs for the Hawaiian damselflies (see Table 4). Because the streams and upland foraging and cover areas required by the blackline and crimson Hawaiian damselflies are dispersed in the lowland wet ecosystem, the lowland wet ecosystem physical or biological features are essential to the damselfly species because they provide for the proper ecological functioning of this ecosystem. This area 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 this area is not currently occupied by the plants *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, C. calycina, C. crispa, C. grimesiana* ssp. *grimesiana, C. humboldtiana, C. koolauensis, C. lanceolata, C. purpurellifolia, C. st.-johnii, C. truncata, Cyrtandra dentata, C. gracilis, C. polyantha, C. sessilis, C. subumbellata, C. viridiflora, C. waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, L. oahuensis, Melicope hiiakae, M. lydgatei, Myrsine juddii, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, P. princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis, Zanthoxylum oahuense,* or the oceanic Hawaiian damselfly, 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 9 (and) Blackline Hawaiian damselfly—Unit 4—Lowland Wet (and) Crimson Hawaiian damselfly—Unit 4—Lowland Wet (and) Oceanic Hawaiian damselfly—Unit 5—Lowland Wet

This area consists of 15,728 ac (6,365 ha) in the lowland wet ecosystem on the leeward side of the Koolau Mountains, on Federal (U.S. Fish and Wildlife Service), State, City and County of Honolulu, and privately owned land, partially within the Ewa FR Waimano Section and the Oahu Forest National Wildlife Refuge. This area extends along the Koolau summit from Waipio to Manaiki Stream, and is occupied by the plants *Chamaesyce rockii, Cyanea calycina, C. humboldtiana, C. koolauensis, C. st.-johnii, Cyrtandra viridiflora, Gardenia mannii, Hesperomannia arborescens, Labordia cyrtandrae, Lobelia oahuensis, Melicope hiiakae, M. lydgatei, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *princeps, Platydesma cornuta* var. *cornuta, Pteris lidgatei, Tetraplasandra gymnocarpa, Viola oahuensis,* and *Zanthoxylum oahuense,* and by the blackline and crimson Hawaiian damselflies. This area includes the wet forest and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the lowland wet ecosystem, as well as unique PCEs for the Hawaiian damselflies (see Table 4). Because the streams and upland foraging and cover areas required by the blackline and crimson Hawaiian damselflies are dispersed in the lowland wet ecosystem, the lowland wet ecosystem physical or biological features are essential to the damselfly species because they provide for the proper ecological functioning of this ecosystem. This area 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 this area is not currently occupied by *Adenophorus periens, Cyanea acuminata, C. crispa, C. grimesiana* ssp. *grimesiana, C. lanceolata, C. purpurellifolia, C. truncata, Cyrtandra dentata, C. gracilis, C. kaulantha, C. polyantha, C. sessilis, C. subumbellata, C. waiolani, Huperzia nutans, Isodendrion longifolium, Lobelia gaudichaudii* ssp. *koolauensis, Myrsine juddii, Plantago princeps* var. *longibracteata, Platanthera holochila, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Sanicula purpurea, Trematolobelia singularis,* or the oceanic Hawaiian damselfly, 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 10 (and) Blackline Hawaiian damselfly—Unit 5—Lowland Wet (and) Crimson Hawaiian damselfly—Unit 5—Lowland Wet (and) Oceanic Hawaiian damselfly—Unit 6—Lowland Wet

This area consists of 124 ac (50 ha) in the lowland wet ecosystem on private land on the windward side of the Koolau Mountains, along Kaalaea Stream. This area is occupied by the blackline Hawaiian damselfly, and includes the wet forest and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the lowland wet ecosystem, as well as unique PCEs for the blackline Hawaiian damselfly (see Table 4). Because the streams and upland foraging and cover areas required by the blackline Hawaiian damselfly are dispersed in the lowland wet ecosystem, the lowland wet ecosystem physical or biological features are essential to this damselfly species because they provide for the proper ecological functioning of this ecosystem. This area 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 this area is not currently occupied by *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, C. calycina, C. crispa, C. grimesiana* ssp. *grimesiana, C. humboldtiana, C. koolauensis, C. lanceolata, C. purpurellifolia, C. st.-johnii, C. truncata, Cyrtandra dentata, C. gracilis, C. kaulantha, C. polyantha, C. sessilis, C. subumbellata, C. viridiflora, C. waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, L. oahuensis, Melicope hiiakae, M. lydgatei, Myrsine juddii, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, P. princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis, Zanthoxylum oahuense,* or the crimson and oceanic Hawaiian damselflies, 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 11 (and) Blackline Hawaiian damselfly—Unit 6—Lowland Wet (and) Crimson Hawaiian damselfly—Unit 6—Lowland Wet (and) Oceanic Hawaiian damselfly—Unit 7—Lowland Wet

This area consists of 124 ac (50 ha) in the lowland wet ecosystem, owned by the City and County of Honolulu on the windward side of the Koolau Mountains, along Waihee Stream. This area is occupied by the blackline and oceanic Hawaiian damselflies, and includes the wet forest and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the lowland wet ecosystem, as well as unique PCEs for the Hawaiian damselflies (see Table 4). Because the streams and upland foraging and cover areas required by the blackline and oceanic Hawaiian damselflies are dispersed in the lowland wet ecosystem, the lowland wet ecosystem physical or biological features are essential to these damselfly species because they provide for the proper ecological functioning of this ecosystem. This area 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 this area is not currently occupied by *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, C. calycina, C. crispa, C. grimesiana* ssp. *grimesiana, C. humboldtiana, C. koolauensis, C. lanceolata, C. purpurellifolia, C. st.-johnii, C. truncata, Cyrtandra dentata, C. gracilis, C. kaulantha, C. polyantha, C. sessilis, C. subumbellata, C. viridiflora, C. waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, L. oahuensis, Melicope hiiakae, M. lydgatei, Myrsine juddii, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, P. princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis, Zanthoxylum oahuense,* or the crimson Hawaiian damselfly, 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 12 (and) Blackline Hawaiian damselfly—Unit 7—Lowland Wet (and) Crimson Hawaiian damselfly—Unit 7—Lowland Wet (and) Oceanic Hawaiian damselfly—Unit 8—Lowland Wet

This area consists of 53 ac (21 ha) in the lowland wet ecosystem on privately owned land on the windward side of the Koolau Mountains, along Kahaluu Stream and tributary. This area is occupied by the blackline Hawaiian damselfly, and includes the wet forest and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the lowland wet ecosystem, as well as unique PCEs for this Hawaiian damselfly (see Table 4). Because the streams and upland foraging and cover areas required by the blackline Hawaiian damselfly are dispersed in the lowland wet ecosystem, the lowland wet ecosystem physical or biological features are essential to this damselfly species because they provide for the proper ecological functioning of this ecosystem. This area 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 this area is not currently occupied by *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, C. calycina, C. crispa, C. grimesiana* ssp. *grimesiana, C. humboldtiana, C. koolauensis, C. lanceolata, C. purpurellifolia, C. st.-johnii, C. truncata, Cyrtandra dentata, C. gracilis, C. kaulantha, C. polyantha, C. sessilis, C. subumbellata, C. viridiflora, C. waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, L. oahuensis, Melicope hiiakae, M. lydgatei, Myrsine juddii, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, P. princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis, Zanthoxylum oahuense,* or the crimson and oceanic Hawaiian damselflies, 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 13 (and) Blackline Hawaiian damselfly—Unit 8—Lowland Wet (and) Crimson Hawaiian damselfly—Unit 8—Lowland Wet (and) Oceanic Hawaiian damselfly—Unit 9—Lowland Wet

This area consists of 161 ac (65 ha) in the lowland wet ecosystem in Federal and City and County of Honolulu land on the windward side of the Koolau Mountains, along Heeia Stream and tributaries. This area is occupied by the blackline Hawaiian damselfly, and includes the wet forest and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the lowland wet ecosystem, as well as unique PCEs for this Hawaiian damselfly (see Table 4). Because the streams and upland foraging and cover areas required by the blackline Hawaiian damselfly are dispersed in the lowland wet ecosystem, the lowland wet ecosystem physical or biological features are essential to this damselfly species because they provide for the proper ecological functioning of this ecosystem. This area 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 this area is not currently occupied by *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, C. calycina, C. crispa, C. grimesiana* ssp. *grimesiana, C. humboldtiana, C. koolauensis, C. lanceolata, C. purpurellifolia, C. st.-johnii, C. truncata, Cyrtandra dentata, C. gracilis, C. kaulantha, C. polyantha, C. sessilis, C. subumbellata, C. viridiflora, C. waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, L. oahuensis, Melicope hiiakae, M. lydgatei, Myrsine juddii, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, P. princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp.

oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis, Zanthoxylum oahuense, or the crimson and oceanic Hawaiian damselflies, 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 14 (and) Blackline Hawaiian damselfly—Unit 9—Lowland Wet (and) Crimson Hawaiian damselfly—Unit 9—Lowland Wet (and) Oceanic Hawaiian damselfly—Unit 10—Lowland Wet

This area consists of 478 ac (193 ha) in the lowland wet ecosystem on State and City and County of Honolulu land on the leeward side of the Koolau Mountains, extending from the Wilson Tunnel area southeast to Moole Stream. This area is occupied by the plant *Cyanea koolauensis,* and by the blackline Hawaiian damselfly, and includes the wet forest and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the lowland wet ecosystem, as well as unique PCEs for the Hawaiian damselfly (see Table 4). Because the streams and upland foraging and cover areas required by the blackline Hawaiian damselfly are dispersed in the lowland wet ecosystem, the lowland wet ecosystem physical or biological features are essential to the damselfly species because they provide for the proper ecological functioning of this ecosystem. This area 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 this area is not currently occupied by *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, C. calycina, C. crispa, C. grimesiana* ssp. *grimesiana, C. humboldtiana, C. lanceolata, C. purpurellifolia, C. st.-johnii, C. truncata, Cyrtandra dentata, C. gracilis, C. kaulantha, C. polyantha, C. sessilis, C. subumbellata, C. viridiflora, C. waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, L. oahuensis, Melicope hiiakae, M. lydgatei, Myrsine juddii, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, P. princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis, Zanthoxylum oahuense,* or the crimson and oceanic Hawaiian damselflies, 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 15 (and) Blackline Hawaiian damselfly—Unit 10—Lowland Wet (and) Crimson Hawaiian damselfly—Unit 10—Lowland Wet (and) Oceanic Hawaiian damselfly—Unit 11—Lowland Wet

This area consists of 407 ac (165 ha) in the lowland wet ecosystem on State of Hawaii Department of Land and Natural Resources Land Division land on the windward side of the Koolau Mountains in Maunawili Valley, including Omao and Maunawili streams and Kapakahi and Pikoakea Springs. This area is occupied by the plant *Cyanea crispa,* and the blackline Hawaiian damselfly, and includes the wet forest and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the lowland wet ecosystem, as well as unique PCEs for the Hawaiian damselfly (see Table 4). Because the streams and upland foraging and cover areas required by the blackline Hawaiian damselfly are dispersed in the lowland wet ecosystem, the lowland wet ecosystem physical or biological features are essential to this damselfly species because they provide for the proper ecological functioning of this ecosystem. This area 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 this area is not currently occupied by *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, C. calycina, C. grimesiana* ssp. *grimesiana, C. humboldtiana, C. koolauensis, C. lanceolata, C. purpurellifolia, C. st.-johnii, C. truncata, Cyrtandra dentata, C. gracilis, C. kaulantha, C. polyantha, C. sessilis, C. subumbellata, C. viridiflora, C. waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, L. oahuensis, Melicope hiiakae, M. lydgatei, Myrsine juddii, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, P. princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis, Zanthoxylum oahuense,* or the crimson and oceanic Hawaiian damselflies, 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Lowland Wet—Unit 16 (and) Blackline Hawaiian damselfly—Unit 11—Lowland Wet (and) Crimson Hawaiian damselfly—Unit 11—Lowland Wet (and) Oceanic Hawaiian damselfly—Unit 12—Lowland Wet

This area consists of 2,507 ac (1,014 ha) in the lowland wet ecosystem on State, City and County of Honolulu, and private land on the leeward side of the Koolau Mountains, partly within the Honolulu Watershed Forest Reserve, extending from the eastern side of Nuuanu Valley southeast along the Koolau summit to Kulepeamoa Ridge. This area is occupied by the plants *Cyanea acuminata, C. calycina, C. crispa, C. grimesiana* ssp. *grimesiana, C. humboldtiana, C. koolauensis, C. lanceolata, C. st.-johnii, Cyrtandra gracilis, C. polyantha, C. sessilis, Gardenia mannii, Hesperomannia aborescens, Platydesma cornuta* var. *cornuta, Sanicula purpurea,* and *Tetraplasandra gymnocarpa.* This area includes the wet forest and shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). This area also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs (including the

unique PCEs for the Hawaiian damselfly) necessary for the expansion of the existing wild populations. Although this area is not currently occupied by *Adenophorus periens, Chamaesyce rockii, Cyanea purpurellifolia, C. truncata, Cyrtandra dentata, C. kaulantha, C. subumbellata, C. viridiflora, C. waiolani, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, L. oahuensis, Melicope hiiakae, M. lydgatei, Myrsine juddii, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, P. princeps* var. *princeps, Platanthera holochila, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Trematolobelia singularis, Viola oahuensis, Zanthoxylum oahuense,* or the blackline, crimson or oceanic Hawaiian damselflies, 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Montane Wet—Unit 1 consists of 370 ac (150 ha) in the montane wet ecosystem at the summit of the Waianae Mountains at Kaala, on City and County of Honolulu and State land, and partially within the Mokuleia Forest Reserve and the Kaala Natural Area Reserve. This unit is occupied by the plants *Cyanea acuminata, C. calycina, Labordia cyrtandrae, Melicope christophersenii,* and *Schiedea trinervis,* and includes the wet forest and shrubland, the moisture regime, 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 these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Oahu—Montane Wet—Unit 1 is not known to be occupied by the plants *Alectryon macrococcus* var. *macrococcus, Lobelia oahuensis,* or *Phyllostegia hirsuta,* 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, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Oahu—Dry Cliff—Unit 1 consists of 49 ac (20 ha) in the dry cliff ecosystem, on the leeward side of the Waianae Mountains, along the rim of Makua Valley. This unit is on State land within the Pahole Natural Area Reserve, and includes the shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). This unit is occupied by the plants *Alectryon macrococcus, Cenchrus agrimonioides, Chamaesyce herbstii, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Kadua degeneri, Plantago princeps* var. *princeps,* and *Schiedea obovata.* 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 Oahu—Dry Cliff—Unit 1 is not currently occupied by *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Bonamia menziesii, Chamaesyce kuwaleana, Diellia falcata, D. unisora, Dubautia herbtsobatae, Eragrostis fosbergii, Flueggea neowawraea, Gouania meyenii, G. vitifolia, Isodendrion laurifolium, I. pyrifolium, Kadua parvula, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, M. saint-johnii, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, S. trinervis, Silene lanceolata, S. perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme, T. lepidotum* ssp. *lepidotum,* or *Viola chamissoniana* ssp. *chamissoniana,* 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 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.

Oahu—Dry Cliff—Unit 2 consists of 412 ac (167 ha) in the dry cliff ecosystem, on the leeward side of the Waianae Mountains, along the ridge from Keaau to Ohikilolo. This unit is on State and City and County of Honolulu land almost entirely within the Makua Keaau Forest Reserve, and includes the shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). Dry Cliff—Unit 2 is occupied by the plants *Abutilon sandwicense, Alectryon macrococcus, Dubautia herbstobatae, Gouania vitifolia, Kadua parvula, Lepidium arbuscula, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Nototrichium humile, Peucedanum sandwicense, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Sanicula mariversa, Schiedea hookeri, Tetramolopium filiforme,* and *Viola chamissoniana* ssp. *chamissoniana.* 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 Oahu—Dry Cliff—Unit 2 is not currently occupied by *Achyranthes splendens* var. *rotundata, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, C. kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, D. unisora, Eragrostis fosbergii, Flueggea neowawraea, Gouania meyenii, Isodendrion laurifolium, I. pyrifolium, Kadua degeneri, Korthalsella degeneri, Lipochaeta lobata* var. *leptophylla, Melicope saint-johnii, Neraudia angulata, Phyllostegia kaalaensis, Plantago princeps* var. *princeps, Pteralyxia macrocarpa, Schiedea obovata, S. trinervis, Silene lanceolata, S. perlmanii, Spermolepis hawaiiensis,* or *Tetramolopium lepidotum* ssp. *lepidotum,* 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 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.

Oahu—Dry Cliff—Unit 3 consists of 450 ac (182 ha) in the dry cliff ecosystem on the leeward side of the Waianae Mountains, along the eastern rim of Makaha Valley along Kamaileunu Ridge. This unit is on State and City and County of Honolulu land partially within the Waianae Kai Forest Reserve, and includes the shrubland, the moisture regime, and subcanopy and understory native plant species

identified as physical or biological features in the dry cliff ecosystem (see Table 4). This unit is occupied by the plants *Abutilon sandwicense, Alectryon macrococcus, Bonamia menziesii, Diellia falcata, Dubautia herbstobatae, Eragrostis fosbergii, Flueggea neowawraea, Gouania meyenii, Isodendrion laurifolium, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea hookeri, Silene lanceolata, Tetramolopium filiforme,* and *Viola chamissoniana* ssp. *chamissoniana.* 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 Oahu—Dry Cliff—Unit 3 is not currently occupied by *Achyranthes splendens* var. *rotundata, Cenchrus agrimonioides, Chamaesyce herbstii, C. kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia unisora, Gouania vitifolia, Isodendrion pyrifolium, Kadua degeneri, K. parvula, Melicope saint-johnii, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Sanicula mariversa, Schiedea obovata, S. trinervis, Silene perlmanii, Spermolepis hawaiiensis,* or *Tetramolopium lepidotum* ssp. *lepidotum,* 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 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.

Oahu—Dry Cliff—Unit 4 consists of 108 ac (44 ha) in the dry cliff ecosystem on the leeward side of the Waianae Mountains, along Kauaopuu ridge, which divides Waianae Kai and Lualualei valleys. This unit is on State and Federal land partially within the Waianae Kai Forest Reserve, and includes the shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). This unit is occupied by the plants *Alectryon macrococcus, Chamaesyce kuwaleana,* and *Spermolepis hawaiiensis.* 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 Oahu—Dry Cliff—Unit 4 is not currently occupied by *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, D. unisora, Dubautia herbstobatae, Eragrostis fosbergii, Flueggea neowawraea, Gouania meyenii, G. vitifolia, Isodendrion laurifolium, I. pyrifolium, Kadua degeneri, K. parvula, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, M. saint-johnii, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, S. obovata, S. trinervis, Silene lanceolata, S. perlmanii, Tetramolopium filiforme, T. lepidotum* ssp. *lepidotum,* or *Viola chamissoniana* ssp. *chamissoniana,* 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 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.

Oahu—Dry Cliff—Unit 5 consists of 26 ac (10 ha) in the dry cliff ecosystem, on the leeward side of the Waianae Mountains in Federal land (U.S. Navy) between Kolekole Pass and Puuhapapa, and includes the shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). This unit is occupied by the plants *Alectryon macrococcus, Bonamia menziesii, Flueggea neowawraea, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Nototrichium humile, Platydesma cornuta* var. *decurrens, Pleomele forbesii,* and *Schiedea hookeri.* 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 Oahu—Dry Cliff—Unit 5 is not currently occupied by *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Cenchrus agrimonioides, Chamaesyce herbstii, C. kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, D. unisora, Dubautia herbstobatae, Eragrostis fosbergii, Gouania meyenii, G. vitifolia, Isodendrion laurifolium, I. pyrifolium, Kadua degeneri, K. parvula, Korthalsella degeneri, Lepidium arbuscula, Melanthera tenuifolia, Melicope makahae, M. saint-johnii, Neraudia angulata, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps* var. *princeps, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea obovata, S. trinervis, Silene lanceolata, S. perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme, T. lepidotum* ssp. *lepidotum,* or *Viola chamissoniana* ssp. *chamissoniana,* 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 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.

Oahu—Dry Cliff—Unit 6 consists of 255 ac (103 ha) in the dry cliff ecosystem on the leeward side of the Waianae Mountains, on State and Federal (U.S. Navy) land along the rim of Lualualei Valley from Puukanehoa to Puukaua. A portion of this area was part of the Honouliuli Preserve, managed by The Nature Conservancy of Hawaii, and was recently acquired by the State. This unit includes the shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4), and is occupied by the plants *Cenchrus agrimonioides, Diellia unisora, Flueggea neowawraea, Lepidium arbuscula, Lobelia niihauensis, Melicope saint-johnii, Neraudia angulata, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa,* and *Tetramolopium lepidotum* ssp. *lepidotum.* 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 Oahu—Dry Cliff—Unit 6 is not currently occupied by *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Alectryon macrococcus, Bonamia menziesii,*

Chamaesyce herbstii, C. kuwaleana, Cyanea grimesiana ssp. *obatae, Cyrtandra dentata, Diellia falcata, Dubautia herbstobatae, Eragrostis fosbergii, Gouania meyenii, G. vitifolia, Isodendrion laurifolium, I. pyrifolium, Kadua degeneri, K. parvula, Korthalsella degeneri, Lipochaeta lobata* var. *leptophylla, Melanthera tenuifolia, Melicope makahae, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Platydesma cornuta* var. *decurrens, Sanicula mariversa, Schiedea hookeri, S. obovata, S. trinervis, Silene lanceolata, S. perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme,* or *Viola chamissoniana* ssp. *chamissoniana,* 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 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.

Oahu—Dry Cliff—Unit 7 consists of 208 ac (84 ha) in the dry cliff ecosystem on the leeward side of the Waianae Mountains, on State and Federal (U.S. Navy) land along the rim of Lualualei Valley from Pohakea to Palikea. A small portion of this area was part of the Honouliuli Preserve, managed by The Nature Conservancy of Hawaii, and was recently acquired by the State. This unit includes the shrubland, the moisture regime, and 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 *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Diellia unisora, Flueggea neowawraea, Kadua parvula, Lepidium arbuscula, Melicope saint-johnii, Neraudia angulata, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Silene perlmanii,* and *Viola chamissoniana* ssp. *chamissoniana.* 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 Oahu—Dry Cliff—Unit 7 is not currently occupied by *Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, C. kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, Dubautia herbstobatae, Eragrostis fosbergii, Gouania meyenii, G. vitifolia, Isodendrion laurifolium, I. pyrifolium, Kadua degeneri, Korthalsella degeneri, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, S. obovata, S. trinervis, Silene lanceolata, S. perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme,* or *T. lepidotum* ssp. *lepidotum,* 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 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.

Oahu—Dry Cliff—Unit 8 consists of 259 ac (105 ha) in the dry cliff ecosystem on the leeward side of the Waianae Mountains, on State land along the rim of Nanakuli Valley from Palehua to Puumanawanua, and partially within the Nanakuli Forest Reserve. A small portion of this area was part of the Honouliuli Preserve, managed by The Nature Conservancy of Hawaii, and was recently acquired by the State. This unit includes the shrubland, the moisture regime, and 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 *Abutilon sandwicense, Bonamia menziesii, Flueggea neowawraea, Lobelia niihauensis, Neraudia angulata, Nototrichium humile,* and *Pleomele forbesii.* 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 Oahu—Dry Cliff—Unit 8 is not currently occupied by *Achyranthes splendens* var. *rotundata, Alectryon macrococcus, Cenchrus agrimonioides, Chamaesyce herbstii, C. kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, D. unisora, Dubautia herbstobatae, Eragrostis fosbergii, Gouania meyenii, G. vitifolia, Isodendrion laurifolium, I. pyrifolium, Kadua degeneri, K. parvula, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Melanthera tenuifolia, Melicope makahae, M. saint-johnii, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, S. obovata, S. trinervis, Silene lanceolata, S. perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme, T. lepidotum* ssp. *lepidotum,* or *Viola chamissoniana* ssp. *chamissoniana,* 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 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.

Oahu—Wet Cliff—Unit 1 consists of 235 ac (95 ha) in the wet cliff ecosystem on State and City and County of Honolulu land in the Waianae Mountains, near the summit of Kaala, and partially within the Mokuleai and Waianae Kai FRs and the Kaala Natural Area Reserve. This unit includes the shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). Oahu—Wet Cliff—Unit 1 is occupied by the plants *Cyanea calycina, Melicope christophersenii,* and *Schiedea trinervis.* 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 Oahu—Wet Cliff—Unit 1 is not currently occupied by *Cyanea acuminata, Labordia cyrtandrae, Lobelia oahuensis, Phyllostegia hirsuta, Pteralyxia macrocarpa, Schiedea hookeri,* or *S. kaalae,* 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 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.

Oahu—Wet Cliff—Unit 2 consists of 7 ac (3 ha) in the wet cliff ecosystem on State and Federal land (U.S. Navy) in the Waianae Mountains at Puuhapapa, partially within a small area that was part of the Honouliuli Preserve, managed by The Nature Conservancy of Hawaii, and was recently acquired by the State. This unit includes the

shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). Oahu—Wet Cliff—Unit 2 is occupied by the plants *Cyanea calycina* and *Melicope christophersenii.* 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 Oahu—Wet Cliff—Unit 2 is not currently occupied by *Cyanea acuminata, Labordia cyrtandrae, Lobelia oahuensis, Phyllostegia hirsuta, Pteralyxia macrocarpa, Schiedea hookeri, S. kaalae,* or *S. trinervis,* 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 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.

Oahu—Wet Cliff—Unit 3 consists of 16 ac (6 ha) in the wet cliff ecosystem on State land in the Waianae Mountains at Puukanehoa, partially within an area that was part of the Honouliuli Preserve, managed by The Nature Conservancy of Hawaii, and was recently acquired by the State. This unit includes the shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). Although Oahu—Wet Cliff—Unit 3 is not currently occupied by *Cyanea acuminata, C. calycina, Labordia cyrtandrae, Lobelia oahuensis, Melicope christophersenii, Phyllostegia hirsuta, Pteralyxia macrocarpa, Schiedea hookeri, S. kaalae,* or *S. trinervis,* 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 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.

Oahu—Wet Cliff—Unit 4 consists of 23 ac (9 ha) in the wet cliff ecosystem on State land in the Waianae Mountains at Puukaua, partially overlapping an area that was part of the Honouliuli Preserve, managed by The Nature Conservancy of Hawaii, and was recently acquired by the State. This unit includes the shrubland, the moisture regime, and 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 plants *Phyllostegia hirsuta* and *Schiedea hookeri.* 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 Oahu—Wet Cliff—Unit 4 is not currently occupied by *Cyanea acuminata, C. calycina, Labordia cyrtandrae, Lobelia oahuensis, Melicope christophersenii, Pteralyxia macrocarpa, Schiedea kaalae,* or *S. trinervis,* 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 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.

Oahu—Wet Cliff—Unit 5 consists of 43 ac (17 ha) in the wet cliff ecosystem on State and Federal (U.S. Navy) land in the Waianae Mountains, at Palikea and north of Palikea. This unit includes the shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). Although Oahu—Wet Cliff—Unit 5 is not currently occupied by *Cyanea acuminata, C. calycina, Labordia cyrtandrae, Lobelia oahuensis, Melicope christophersenii, Phyllostegia hirsuta, Pteralyxia macrocarpa, Schiedea hookeri, S. kaalae,* or *S. trinervis,* 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 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.

Oahu—Wet Cliff—Unit 6 (and) Crimson Hawaiian Damselfly—Unit 12—Lowland Wet (and) Oceanic Hawaiian Damselfly—Unit 13—Lowland Wet

This area consists of 151 ac (61 ha) in the wet cliff ecosystem on State land on the windward side of the Koolau Mountains in Kaipapau Gulch, entirely within the Kaipapau Forest Reserve. This area includes the shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem, as well as the unique species PCEs for the Hawaiian damselflies (see Table 4). Because the streams and upland foraging and cover areas required by the crimson and oceanic Hawaiian damselflies are dispersed in the wet cliff ecosystem, the wet cliff ecosystem's physical or biological features are essential to the damselfly species because they provide for the proper ecological functioning of this ecosystem. This area is occupied by *Cyanea crispa, Huperzia nutans, Pteralyxia macrocarpa, Schiedea kaalae,* and the oceanic Hawaiian damselfly. This area 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 this area is not currently occupied by the plants *Adenophorus periens, Chamaesyce deppeana, C. rockii, Cyanea acuminata, C. calycina, C. humboldtiana, C. purpurellifolia, C. st.-johnii, C. truncata, Cyrtandra kaulantha, C. sessilis, C. subumbellata, C. viridiflora, Labordia cyrtandrae, Lobelia oahuensis, Lysimachia filifolia, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *princeps, Psychotria hexandra* ssp. *oahuensis, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* or the crimson Hawaiian damselfly, 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 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.

Oahu—Wet Cliff—Unit 7 (and) Crimson Hawaiian Damselfly—Unit 13—Lowland Wet (and) Oceanic Hawaiian Damselfly—Unit 14—Lowland Wet

This area consists of 144 ac (58 ha) in the wet cliff ecosystem on State land on the windward side of the Koolau Mountains in Hauula Gulch, entirely within the Hauula Forest Reserve. This unit includes the shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem, as

well as the unique species PCEs for the crimson and oceanic Hawaiian damselflies (see Table 4). Because the streams and upland foraging and cover areas required by the crimson and oceanic Hawaiian damselflies are dispersed in the wet cliff ecosystem, the wet cliff ecosystem's physical or biological features are essential to the damselfly species because they provide for the proper ecological functioning of this ecosystem. This area is occupied by *Cyanea crispa, Psychotria hexandra* ssp. *oahuensis, Schiedea kaalae,* and the crimson and oceanic Hawaiian damselflies. This area 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 this area is not currently occupied by *Adenophorus periens, Chamaesyce deppeana, C. rockii, Cyanea acuminata, C. calycina, C. humboldtiana, C. purpurellifolia, C. st.-johnii, C. truncata, Cyrtandra kaulantha, C. sessilis, C. subumbellata, C. viridiflora, Huperzia nutans, Labordia cyrtandrae, Lobelia oahuensis, Lysimachia filifolia, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *princeps, Pteralyxia macrocarpa, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis,* or *Viola oahuensis,* 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 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.

Oahu—Wet Cliff—Unit 8 (and) Crimson Hawaiian Damselfly—Unit 14—Lowland Wet (and) Oceanic Hawaiian Damselfly—Unit 15—Lowland Wet

This area consists of 4,649 ac (1,881 ha) in the wet cliff ecosystem on State, City and County of Honolulu, State of Hawaii Department of Land and Natural Resources Land Division, and private land, along the summit of the Koolau Mountains, overlapping portions of Sacred Falls State Park, the Waiahole FR (Waiahole and Iolekaa sections), the Kaneohe and Honolulu Watershed FRs, and the Nuuana Pali State Wayside. This unit includes the shrubland, the moisture regime, and subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem, as well as the unique species PCEs for the crimson and oceanic Hawaiian damselflies (see Table 4). Because the streams and upland foraging and cover areas required by the crimson and oceanic Hawaiian damselflies are dispersed in the wet cliff ecosystem, the wet cliff ecosystem's physical or biological features are essential to the damselfly species because they provide for the proper ecological functioning of this ecosystem. This area is occupied by the plants *Cyanea acuminata, C. calycina, C. humboldtiana, C. purpurellifolia, C. st.-johnii, Cyrtandra kaulantha, C. sessilis, C. subumbellata, C. viridiflora, Huperzia nutans, Labordia cyrtandrae, Lobelia oahuensis, Lysimachia filifolia, Phyllostegia hirsuta, P. parviflora* var. *parviflora, Plantago princeps* var. *princeps, Pteralyxia macrocarpa, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis,* and *Viola oahuensis.* 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 this area is not currently occupied by *Adenophorus periens, Chamaesyce deppeana, C. rockii, Cyanea crispa, C. truncata, Psychotria hexandra* ssp. *oahuensis, Schiedea kaalae,* or the crimson or oceanic Hawaiian damselflies, 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 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.

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 et al.,* 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 those actions with discretionary involvement or control 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. This includes activities on State, tribal, local, or private lands requiring 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.*), 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). These types of activities are subject to the section 7 consultation process. 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 project 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 to an extent that appreciably reduces the conservation value of critical habitat for the 124 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 124 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 analyzed 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. Each of the Department of Defense (DOD) installations identified below owns or manages such lands, which have been analyzed for

exemption under the authority of section 4(a)(3) of the Act.

Approved INRMPs

The U.S. Army has six training installations under its jurisdiction on the island of Oahu: Dillingham Military Reservation (DMR), Kawailoa Training Area (KLOA), Kahuku Training Area (KTA), Makua Military Reservation (MMR), Schofield Barracks Military Reservation (SBMR), and Schofield Barracks Military Reservation—East Range (SBER). These lands are administered by the Army Garrison Hawaii for various types of military training. In our 2003 final rule to designate critical habitat for 99 plant species on Oahu (68 FR 35950), we did not designate critical habitat on areas managed by the Army that met the following criteria: (1) The area was subject to a current and final INRMP that provides a conservation benefit to the species; (2) there were assurances the conservation management strategies will be implemented; and (3) there were assurances the conservation management strategies will be effective. These determinations were based primarily on section 4(b)(2) of the Act.

Our previous analysis determined the ongoing and proposed management activities described in the 2002 INRMP provide a conservation benefit to the plant species, and that the INRMP provided assurances the conservation plan would be implemented and effective (68 FR 35950, June 17, 2003). After applying the above three critera, we determined in the 2003 final rule that 26,946 ac (10,905 ha) of Army lands were exempt from critical habitat designation. Our exclusion analysis of Army lands determined that the benefits of excluding these lands based on impacts to national security and other relevant factors outweighed the benefits of designating these lands as critical habitat. The exclusion of Army lands in the 2003 final rule was based on our review and analysis of the Army's INRMP (Army 2002), Ecosystem Management Plan (Army 1998), and Endangered Species Management Plan (Research Corporation of Hawaii 1998). We also evaluated the monthly and annual summary reports describing natural resources management projects performed under the Ecosystems Management Programs for each of the six Oahu installations, and we reviewed the Army's Wildland Fire Management Plan for Makua Military Installation (Army 2000) and the Draft Wildland Fire Management Plan for the other five Oahu installations (Army 2003).

Subsequent to publication of the 2003 final rule, the National Defense Authorization Act of 2004 (Pub. L. 108–136) was enacted, which amended the Act. The Army's 2001 INRMP was updated in 2010 (see below), and we have reevaluted the conservation and management activities for the species that occur on Army lands within this statutory framework for purposes of this proposed rule.

The Army recently updated their 2001 INRMP, which was finalized in August, 2010 (U.S. Army Garrison Hawaii, 2010). The INRMP identifies management actions during 2010–2014 for threatened, endangered, and candidate species, and critical habitat, for the Oahu elepaio (an endangered flycatcher) on all of their Oahu training installations (U.S. Army Garrison Hawaii 2010, p. 4–1). The INRMP incorporates management actions developed as Implementation Plans by a team of biologists and field experts from State, Federal, and private agencies and organizations, who are familiar with the species and their habitats (U.S. Army Garrision Hawaii 2003; 2008, Addendum; U.S. Army Garrison Hawaii, 2005). The Implementation Plans and Addendum were prepared under the terms of biological opinions issued by the Service (USFWS 1999; USFWS 2003, 356 pp; USFWS 2007, 776 pp.).

Species conservation/management activities conducted under the Army INRMP include (1) Propagation and outplanting of plants to augment existing populations and reintroduce species and populations to areas where they no longer occur; (2) construction of fences to protect plants from feral ungulates; (3) nonnative rodent, slug, and snail control to protect plants from fruit and seed predation and reduce predation of elepaio nests (by rats); (4) habitat restoration (e.g., restoration of fire-altered native habitats to native vegetation, erosion control); (5) control of nonnative plants, nonnative invertebrates (e.g., black-twig borer), and feral ungulate populations; (6) surveys and monitoring of rare plants and animals; (7) monitoring for weeds; and (8) monitoring fenced areas for ungulate activity (U.S. Army Garrison Hawaii 2010, pp. 4–3—4–29). In addition, the Army contracts with field experts to monitor rare plants and conduct predator control on their lands, and supports several important research projects (e.g., developing methods to control nonnative slugs and snails; developing methods to restore nonnative, highly flammable grasslands to native forest vegetation; and determining home range and density of rats (U.S. Army Garrison Hawaii 2010, p. 4–28)).

The Army provides monthly and annual summary reports to the Service regarding the natural resources management projects implemented under to the Implementation Plans and the Addendum, which are integrated in the INRMP for the six installations. These summary reports provide information on management actions implemented and whether they have proven beneficial to listed species and species proposed for listing. Examples of ecosystem management activities that protect rare species habitat and provide conservation benefits include fence construction; removal of feral ungulates from within fenced areas; and minimizing the threat of fire through the control and eradication of fire-tolerant nonnative plant species, construction of fuel breaks, maintenance of existing roads, roadside weed clearing, and investing in firefighting equipment and training fire crews (U.S. Army Garrison Hawaii 2010, p. 4–14 and pp. 4–65—4–66).

In 2003, the Army completed an integrated wildland fire management plan (WFMP) for all of its Oahu training installations, which is integrated in the 2010 INRMP (U.S. Army 2010, p. 4–65). The goal of the WFMP is to reduce the threat of wildfire, which represents a threat to listed and other rare species, including 6 of the 23 species proposed for listing and 34 previously listed plant species that occur on one or more of Oahu's six Army training installations. Specific conservation/management activities for individual plant species are detailed in the Implementation Plans and the Addendum, and integrated in the INRMP (U.S. Army Garrison Hawaii 2010, pp. 4–20—4–22 and Appendix 4). Each of these documents is available online at ''U.S. Army Garrison Hawaii Natural Resource Program Reports,'' *http://manoa.hawaii.edu/hpicesu/dpw.htm.* We reviewed the management activities described in these plans and have determined that they provide conservation benefits to the 14 plant species proposed for listing and 63 previously listed plant species that have been reported on one or more of Oahu's six Army training installations. Accordingly, we have determined that 8,098 ac (3,277 ha) of land on Oahu's six Army training installations (see Figures 1–4) are exempt from critical habitat designation in accordance with section 4(a)(3)(B)(i) of the Act. The conservation actions identified in the 2010–2014 INRMP for the Army's Oahu installations, which incorporates the 2003 and 2008 Implementation Plans, the 2005 Addendum (USFWS 2003, 356

pp; U.S. Army Garrison 2005; USFWS 2007, 776 pp.), and the 2003 WFMP, provide conservation benefits to 14 plant species proposed for listing that occur within the six Oahu training areas, which include *Bidens amplectens, Cyanea calycina, C. lanceolata, C. purpurellifolia, Korthalsella degeneri, Melicope christophersenii, M. hiiakae, M. makahae, Platydesma cornuta* var. *cornuta, P. cornuta* var. *decurrens, Pleomele forbesii, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa,* and *Zanthoxylum oahuense.* The 2010–2014 INRMP also provide conservation benefits to 63 previously listed plant species that occur within the six Oahu training areas, which include *Abutilon sandwicense, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce celastroides* var. *kaenana, C. herbstii, C. rockii, Ctenitis squamigera, Cyanea acuminata, C. crispa, C. grimesiana* ssp. *obatae, C. humboldtiana, C. koolauensis, C. longiflora, C. st.-johnii, C. superba, Cyrtandra dentata, C. subumbellata, C. viridiflora, Delissea subcordata, Diellia falcata, Dubautia herbstobatae, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gardenia mannii, Hesperomannia arborescens, H. arbuscula, Hibiscus brackenridgei, Huperzia nutans, Isodendrion laurifolium, Kadua degeneri, K. parvula, Labordia cyrtandrae, Lepidium arbuscula, Lobelia gaudichaudii* ssp. *koolauensis, L. niihauensis, L. oahuensis, Melanthera tenuifolia, Melicope lydgatei, Myrsine juddii, Neraudia angulata, Nototrichium humile, Phyllostegia hirsuta, P. mollis, Plantago princeps* var. *princeps, Pritchardia kaalae, Pteris lidgatei, Sanicula mariversa, S. purpurea, Schiedea hookeri, S. kaalae, S. nuttallii, S. obovata, S. trinervis, Silene lanceolata, Solanum sandwicense, Spermolepis hawaiiensis, Stenogyne kanehoana, Tetramolopium filiforme, Tetraplasandra gymnocarpa, Viola chamissoniana* ssp. *chamissoniana,* and *V. oahuensis* (see Table 7A and B, above) (U.S. Army Garrison 2003, 2005, 2008, 2010; USFWS 2003, 356 pp.; USFWS 2007, 776 pp.). Figures 1–4 identify the above areas on Army-managed lands that were evaluated under section 4(a)(3)(B)(i) of the Act.

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Figure 1
Dillingham Military Reservation

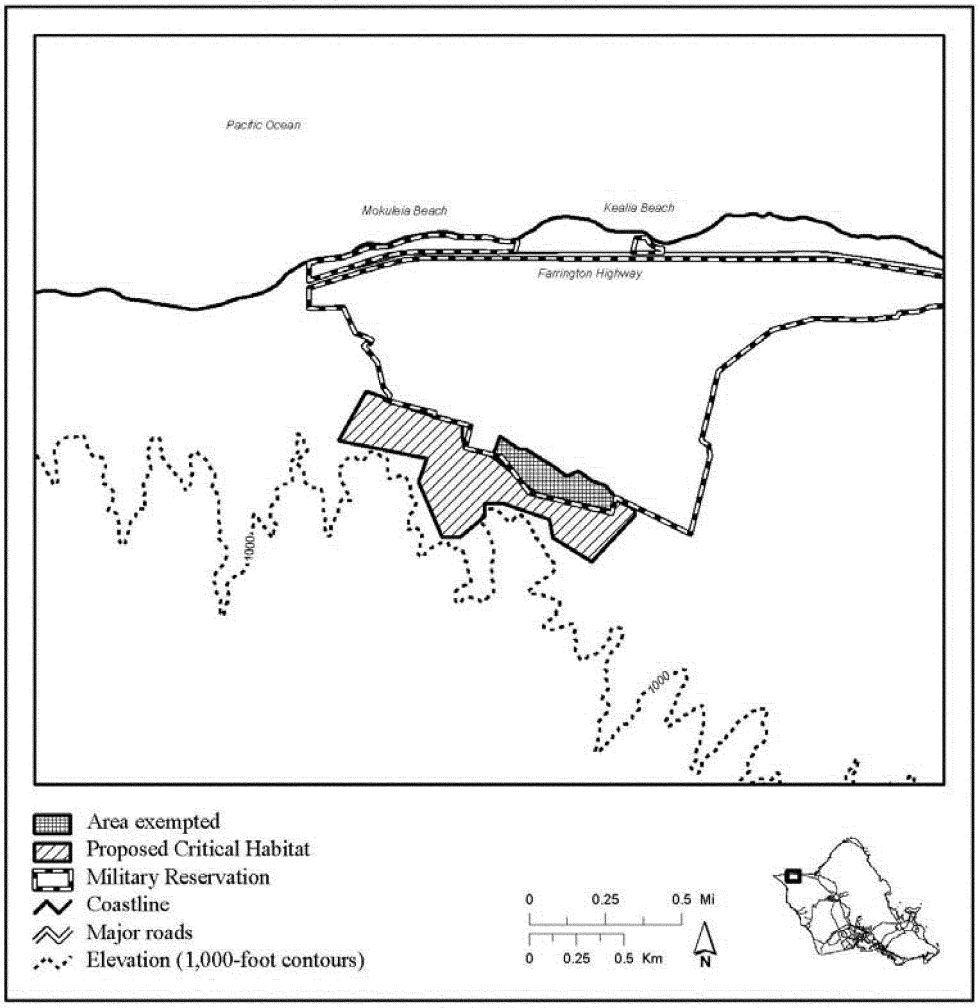


Figure 2
Kahuku Training Area

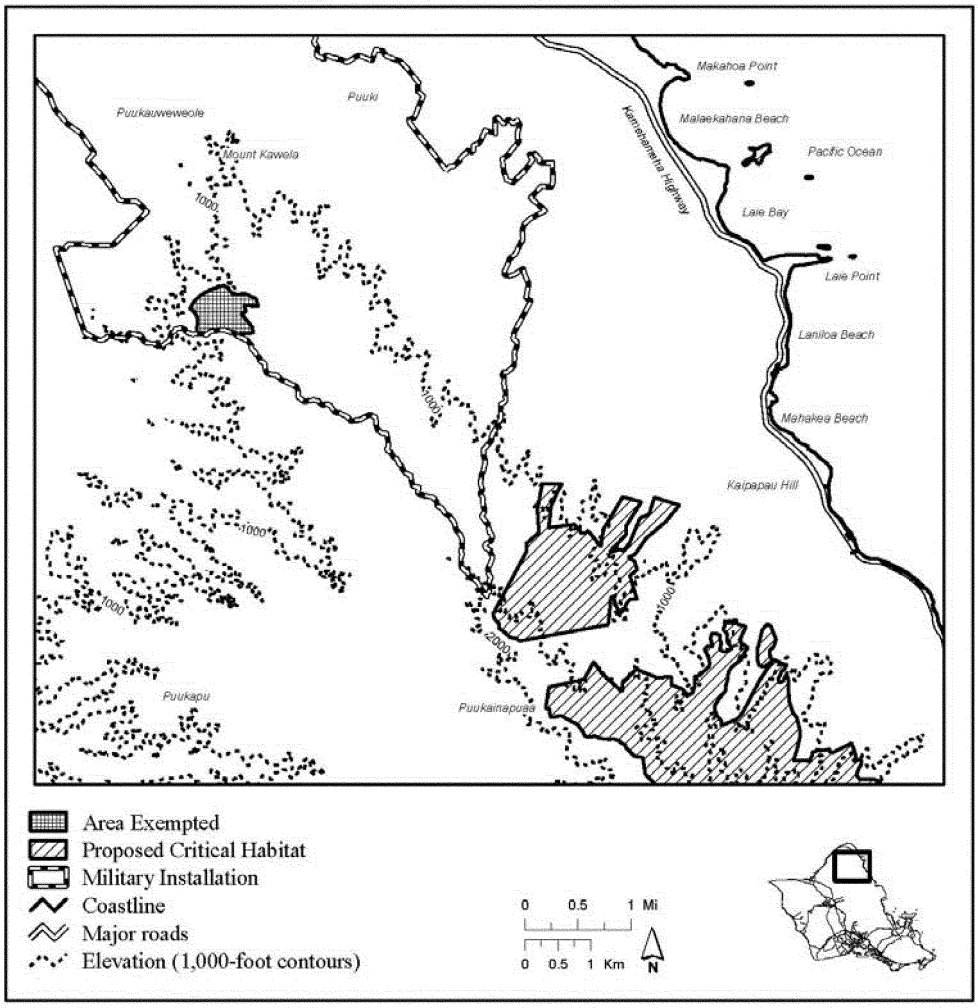


Figure 3
Kawailoa Training Area and
Schofield Barracks Military Reservation - East Range

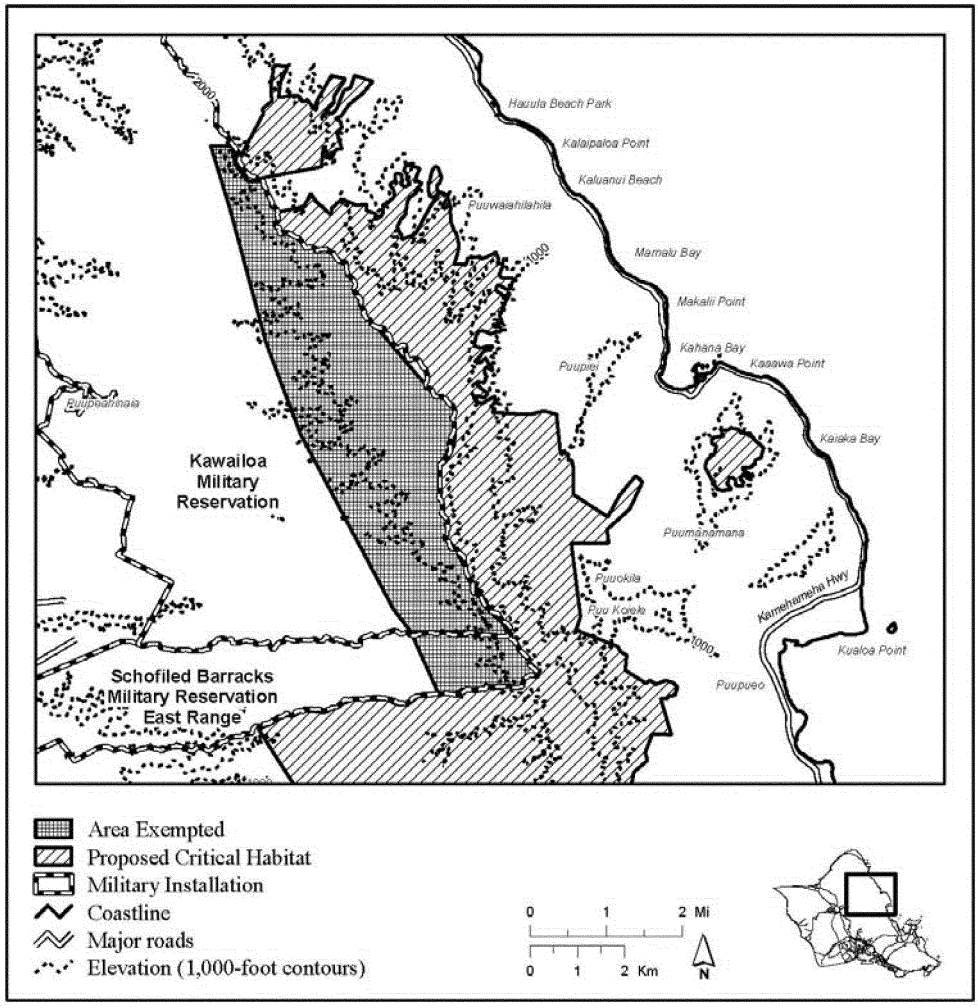
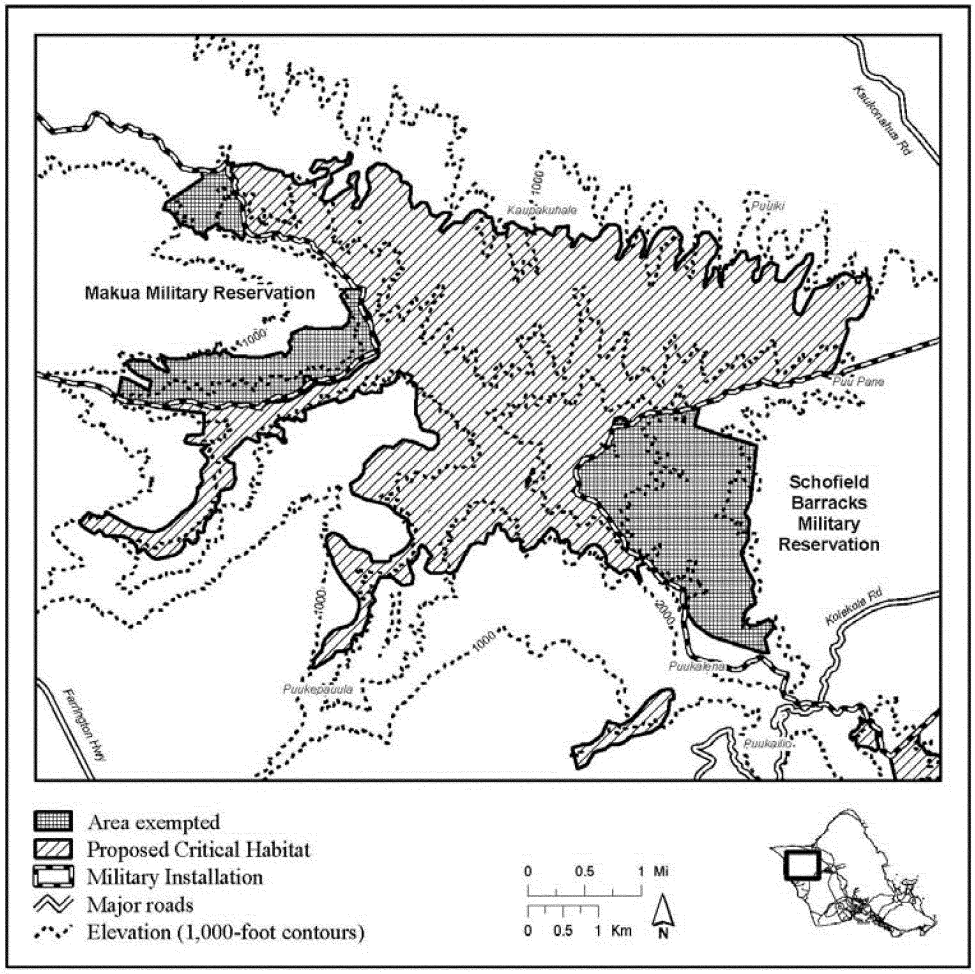


Figure 4
Makua Military Reservation and
Schofield Barracks Military Reservation



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Lands Under U.S. Navy Jurisdiction

The U.S. Navy (Navy) owns or leases much of Lualualei Valley, on Oahu's leeward coast, which is operated as a naval magazine and transmitting facility. The Navy lands at Lualualei are composed of two contiguous facilities, Naval Station Pearl Harbor (NAVMAG PH) Lualualei Branch and Naval Radar Transmittal Facility at Lualualei (NRTF Lualualei). Twenty-one listed plants, which include *Abutilon menziesii, Abutilon sandwicense, Alectryon macrococcus* var. *macrococcus, Bonamia menziesii, Chamaesyce kuwaleana, Diellia unisora, Flueggea neowawraea, Kadua parvula, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Marsilea villosa, Melicope saint-johnii, Neraudia angulata, Nototrichium humile, Plantago princeps* var. *princeps, Schiedea hookeri, Silene perlmanii, Spermolepis hawaiiensis, Tetramolopium lepidotum* ssp. *lepidotum,* and *Viola chamissoniana* ssp. *chamissoniana,* and four species proposed for listing in this proposed rule, which include *Cyanea calycina, Melicope christophersenii, Platydesma cornuta* var. *decurrens,* and *Pleomele forbesii,* occur on NAVMAG PH Lualualei Branch. Three listed plants, which include *Abutilon menziesii, Cyperus trachysanthos,* and *Marsilea villosa* occur on NRTF Lualualei.

In our 2003 final rule (68 FR 35950) to designate critical habitat for 99 plant species on Oahu, we designated approximately 972 ac (approximately 393 ha) of Navy lands as critical habitat for 21 species (*Abutilon sandwicense, C. kuwaleana, Cyanea grimesiana* ssp. *obatae, Diellia falcata, D. unisora, Gouania meyenii, Hesperomannia arbuscula, Kadua parvula, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Marsilea villosa, Melicope pallida, Melicope saint-johnii, Neraudia angulata, Phyllostegia hirsuta, Schiedea hookeri, Silene perlmanii, Stenogyne kanehoana, Tetramolopium lepidotum* ssp. *lepidotum, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana*). We determined that the benefits of designating Navy lands as critical habitat outweighed the benefits of excluding these lands under section 4(b)(2) of the Act.

Subsequent to publication of our 2003 final rule, the Navy developed a draft revision (December 2009) to their 2001 INRMPs, which has not been finalized. Accordingly, we conducted an analysis of the Navy's 2001 INRMPs to determine whether they provide a conservation benefit to the 44 plant species that occur on Navy lands or for which these lands are essential for their conservation, for purposes of section 4(a)(3)(B)(i) of the Act, which include *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Alectryon macrococcus,*

Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, C. kuwaleana, Chamaesyce skottsbergii var. *skottsbergii, Cyanea acuminata, C. calycina, C. grimesiana* ssp. *obatae, Cyperus trachysanthos, Diellia falcata, D. unisora, Flueggea neowawraea, Gouania meyenii, Hesperomannia arbuscula, Kadua parvula, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, L. oahuensis, Marsilea villosa, Melicope christophersenii, M. pallida, M. saint-johnii, Neraudia angulata, Nototrichium humile, Phyllostegia hirsuta, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, S. kaalae, S. trinervis, Silene perlmanii, Spermolepis hawaiiensis, Stenogyne kanehoana, Tetramolopium lepidotum* ssp. *lepidotum, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana.*

The proposed management, protection, and conservation measures for rare plants at NAVMAG PH Lualualei Branch include protecting native communities, monitoring threatened and endangered plants and plants with special conservation status, and controlling the spread of invasive plant species through the use of cooperative agreements and partnerships. The 2001 INRMP states that to protect native plants, the Navy will control feral goats in partnership with other Federal, State, and private organizations, with the goal of eradication in Lualualei Valley. A proposed funding schedule for goat control efforts is included in the INRMP, although the specific goals and objectives for each funding year are not identified. A fenced exclosure was constructed in the Halona Management Area to protect a small population of *Abutilon sandwicense* from feral ungulates (U.S. Navy 2001a, p. 4–44), and another fenced exclosure was constructed at Puu Hapapa Management Area to protect ''about five'' listed species (U.S. Navy 2001a, p. 4–44), which include *Abutilon sandwicense, Bonamia menziesii, Flueggea neowawraea, Lipochaeta lobata* var. *leptophylla,* and *Nototrichium humile* (68 FR 35950). Only 1.5 ac (0.61 ha) of these two management areas, which total 310 ac (125.5 ha), have been fenced and are weeded. In addition, the 2001 INRMP does not address other nonnative animals that may predate native plants, such as rats, slugs, snails, and insects (e.g., black-twig borer). The 2001 INRMP states that existing exclosures should be maintained as needed, but does not require the construction of new fenced exclosures to protect native vegetation or native plant communities.

The leeward coast of the Waianae Mountains (which includes Lualualei Valley) is dangerously prone to forest and range fires during the dry season, however there have been few fires on the installation's valley floor because of effective firebreaks, the presence of a fire station on site and a fire management plan. However, wildfire is a major threat to the forested, less accessible areas in the higher elevations where most of the critical habitat is proposed on Navy lands. The 2001 INRMP refers to the 1997 Management Plan (U.S. Navy 2001a, p. 3–14) for information regarding where fire incidents are likely to negatively impact sensitive natural resources on the installation, and states the onsite Federal fire station would respond to fires on the installation. However, the plan does not include actions to reduce the threat of wildfire, which adversely affects listed and other rare species and their habitat on the higher elevation Navy lands.

To address plant monitoring needs, the 2001 INRMP states that regular monitoring of listed plant species is necessary to ensure their protection and recovery and that ''endangered plants and animals should be monitored as part of the implementation of the monitoring program.'' However, the 2001 INRMP does not describe how monitoring will be implemented, nor does it identify the species to be monitored over the 5-year implementation timeframe (U.S. Navy 2001a, pp. 1–2, 6–7). The plan acknowledges that nonnative, invasive plants threaten native plant communities and should be ''occasionally controlled,'' ''especially in fenced areas where alien plants are competing with endangered plants'' (U.S. Navy 2001a, p. 4–45). The plan does not include a schedule or identify where nonnative plant control will be implemented, other than ''within fenced-in areas as needed'' over the plan's 5-year implementation timeframe (U.S. Navy 2001a, pp. 1–2 and 6–7). The endangered aquatic fern, *Marsilea villosa,* occurs in the northwest corner of the installation in a cattle grazing outlease area, and on NRTF Lualualei lands. The 2001 INRMP does not identify beneficial management actions for this species, although the Navy considers it to be adequately protected on NAVMAG PH lands and not adversely affected under the terms of the grazing lease (M. Kaku, Department of the Navy, in litt. 2001).

The proposed management, protection, and conservation measures for rare plants at NRTF Lualualei, includes mowing nonnative grasses and other vegetation during the dry season to prevent their incursion into the areas where *Marsilea villosa* occurs, monitoring known populations of rare plants, conducting flora surveys, and monitoring feral ungulate populations (U.S. Navy 2001b, pp. 6–7 – 6–11). In addition, the 2001 INRMP recommends that managers evaluate the benefits of controlling nonnative grasses and other plants with ''controlled'' grazing rather than mowing in the areas where *Marsilea villosa* occurs (U.S. Navy 2001b, p. 6–5). Mowing nonnative grasses and other nonnative vegetation to prevent their incursion into the *Marsilea* areas contributes to the maintenance of these individuals in these areas.

Since the 2001 INRMPs were finalized, five subpopulations of *Marsilea villosa* have been reported on Navy lands at Lualualei (NAVMAG PH Lualualei and NRTF Lualualei) (U.S. Navy 2009, in litt. p. 4–49). Three of the subpopulations on NRTF Lualualei are in areas that are regularly mowed, and one is in an area that is not managed for this species. The Navy has posted signs near four of the five subpopulations to avoid inadvertent negative impacts from activities such as mowing when areas are flooded and *Marsilea* is likely to be growing, and to avoid construction and other vehicle traffic (U.S. Navy 2009, in litt. p. 4–49). However, no additional management measures have been developed to protect the species in the cattle grazing outlease area (U.S. Navy 2009, in litt. p. 4–27).

While the Navy's 2001 INRMPs describe management actions such as protective fencing for some individuals of listed plants, which include *Abutilon sandwicense, Bonamia menziesii, Flueggea neowawraea, Lipochaeta lobata* var. *leptophylla,* and *Nototrichium humile,* and mowing restrictions for *Marsilea villosa,* these actions contribute only to maintenance of these individuals, that is, avoiding extirpation rather than improving the potential for their recovery on Navy lands. In addition, the 2001 INRMPs do not address the conservation needs of the other 39 of the 44 species for which we are proposing critical habitat on Navy lands. Therefore, based on our analysis discussed above, we have determined the Navy's 2001 INRMPs do not provide an adequate conservation benefit for 39 previously listed species for which critical habitat is being revised. These species include *Abutilon sandwicense, Achyranthes splendens*

var. *rotundata, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, C. kuwaleana, C. skottsbergii* var. *skottsbergii, Cyanea acuminata, C. grimesiana* ssp. *obatae, Cyperus trachysanthos, Diellia falcata, D. unisora, Flueggea neowawraea, Gouania meyenii, Hesperomannia arbuscula, Kadua parvula, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, L. oahuensis, Marsilea villosa, Melicope pallida, M. saint-johnii, Neraudia angulata, Nototrichium humile, Phyllostegia hirsuta, Plantago princeps* var. *princeps, Sanicula mariversa, Schiedea hookeri, S. kaalae, S. trinervis, Silene perlmanii, Spermolepis hawaiiensis, Stenogyne kanehoana, Tetramolopium lepidotum* ssp. *lepidotum, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana.* The INRMP also does not provide an adequate conservation benefit for the 5 plant species proposed for listing as endangered with critical habitat in this proposed rule: *Cyanea calycina, Melicope christophersenii, Platydesma cornuta* var. *decurrens, Pleomele forbesii,* and *Pteralyxia macrocarpa.* Therefore, we are proposing to designate a total of 567 ac (228 ha) of habitat on Navy lands at NAVMAG PH Lualualei Branch, NRTF Lualualei, and Barber's Point as critical habitat for 45 species. Of the 567 ac (228 ha) of proposed critical habitat, approximately 393 ac (159.2 ha) or 69 percent of the proposed critical habitat on Navy lands is already designated critical habitat (for plants and a bird, the Oahu elepaio).

We will encourage the Navy to work collaboratively with the Service to develop appropriate special management considerations or protections for the 44 species, in light of section 7(a)(1) of the Act and our shared conservation opportunities under section 4(a)(3) of the Act. Examples of activities that would likely satisfy the requirements under section 4(a)(3) of the Act include (but are not limited to) substantially increasing efforts to reduce fragmentation of habitat; establishing, maintaining, or increasing rare plant populations; eradicating ungulates; installing fencing around sensitive areas; controlling the spread of nonnative species; enhancing and restoring habitats; monitoring and reporting habitat conditions and rare plant population status; and similar types of conservation actions. We are available and prepared to work closely with, and provide technical assistance, to the Navy in this regard. We will fully consider all special management considerations or protective measures included in the Navy's revised INRMP in our final critical habitat rule, provided the revised INRMP is finalized within a timeframe consistent with the rulemaking schedule for this regulatory action.

Exclusions

Application of Section 4(b)(2) of the Act

Section 4(b)(2) of the Act states that the Secretary must designate and revise 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 impact 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 designated critical habitat based on economic impacts, impacts on 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 evaluate whether the benefits of exclusion outweigh the benefits of inclusion. If based on this analysis, the Secretary makes this determination, then 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 under section 7 of the Act the 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 essential habitat 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 excluding an area from critical habitat, we consider whether exclusion is likely to result in conservation; the continuation, strengthening, or encouragement of partnerships; or implementation of a management plan that provides equal to or more conservation than a critical habitat designation would provide.

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 essential physical or biological features; whether there is a reasonable expectation that the conservation management strategies and actions contained in the 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.

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** section). 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 Department of Defense (DOD) where a national security impact might exist. In preparing this proposal, we have exempted from the designation of critical habitat those Department of Defense lands with completed INRMPs determined to provide a benefit to the 124 species. We have determined that certain lands within the proposed designation of critical habitat are owned or managed by the DOD (Department of the Navy), at NAVMAG PH Lualualei Branch and NRFT Lualualei. There are also lands owned or managed at six Department of the Army training installations (see discussion under ''*Approved INRMPs''*); however, those lands are not being proposed as critical habitat pursuant to section 4(a)(3)(B)(i) of the Act. At this time, we are unaware of any potential impacts to national security on any DOD lands; therefore, we do not propose to exclude any areas from the final designation based on impacts to national security, but will fully consider all comments in this regard in the final critical habitat designation.

Exclusions Based on Other Relevant Impacts

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts on 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.

In preparing this proposed rule, we have determined that the landowners have not developed conservation plans or other management plans for the 99 previously listed plant species, the two previously listed plant species without designated critical habitat, or the 23 species proposed for listing as endangered. In addition, we have determined there are no conservation partnerships that would be encouraged by the exclusion from critical habitat. We anticipate no impact to partnerships, or habitat conservation plans (HCPs) or other management plans from this proposed critical habitat designation. Accordingly, we do not propose to exert our discretion to exclude any areas from the final designation based on other relevant impacts.

However, as stated under the Public Comments section above, we request specific comments on whether any specific areas proposed for designation for the 124 species should be excluded under section 4(b)(2) of the Act from the final designation. Based on public comments on the draft economic analysis or the proposed designation itself, the Secretary may exclude any area proposed as critical habitat in this rule under section 4(b)(2) of the Act.

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 critical habitat designation is based on scientifically sound data, assumptions, and analyses. We have posted our peer review plan on our Web site at *http://www.fws.gov/informationquality*. We will invite these peer reviewers to comment, during the public comment period, on the specific assumptions and conclusions regarding the proposed 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 rulemaking. 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 in writing within 45 days of the publication of this proposal (see **DATES** section). 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

The Office of Management and Budget (OMB) has determined that this rule is not significant under Executive Order 12866 (E.O. 12866). OMB bases its determination upon the following four criteria:

(1) Whether the rule will have an annual effect of $100 million or more on the economy or adversely affect an economic sector, productivity, jobs, the environment, or other units of the government.

(2) Whether the rule will create inconsistencies with other Federal agencies' actions.

(3) Whether the rule will materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients.

(4) Whether the rule raises novel legal or policy issues.

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.

At this time, we lack all of the available economic information necessary to provide an adequate factual basis for the required RFA finding. Therefore, we defer the RFA finding until completion of the draft economic analysis prepared under section 4(b)(2) of the Act and E.O. 12866. The draft economic analysis will provide the required factual basis for the RFA finding. Upon completion of the draft economic analysis, we will announce availability of the draft economic analysis in the **Federal Register** and reopen the public comment period for the proposed designation. We will include with this announcement, as appropriate, an initial regulatory

flexibility analysis or a certification that the rule will not have a significant economic impact on a substantial number of small entities accompanied by the factual basis for that determination.

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; as well as small businesses. Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than $5 million in annual sales, general and heavy construction businesses with less than $27.5 million in annual business, special trade contractors doing less than $11.5 million in annual business, and agricultural businesses with annual sales less than $750,000. To determine if potential economic impacts to these small entities are significant, the draft economic analysis will 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 to date 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, and (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.

We are specifically aware of some potential development actitities in the Barber's Point area, which could potentially affect the following proposed critical habitat units: Oahu—Coastal 13, Oahu—Coastal 14, Oahu—Coastal 15, Oahu—Lowland Dry 8, Oahu—Lowland Dry 9, Oahu—Lowland Dry 10, and Oahu—Lowland Dry 11. These potential development activities will be evaluated in the draft economic analysis we will prepare for this proposed rule. None of the other proposed critical habitat units contains significant residential, commercial, industrial, or golf-course projects; crop farming; or intensive livestock operations, and few projects are planned for locations in the other proposed critical habitat areas. 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 interior of Oahu.

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 in certain areas, these areas do not contain the PCEs 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 habitats, so they will not be subject to a minimal level of informal section 7 consultation. We anticipate that a developer or other project proponent could modify a project or take measures to protect the 124 Oahu 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, because 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. Since critical habitat was designated on Oahu in June 2003 (for 99 Oahu plants), and, most recently in December 2008 (for 12 picture-wing flies, 73 FR 73795), we have conducted 28 formal consultations and 137 informal consultations on this island, in addition to consultations on Federal grants to State wildlife programs that do not affect small entities. Of these, 13 formal consultations and 34 informal consultations were primarily consultations regarding Federal permits to Service employees to implement conservation actions for listed species. The remainder, 15 formal consultations and 103 informal consultations, involved the U.S. Army, U.S. Army Corps of Engineers, U.S. Marine Corps, U.S. Marine Corps Base of Hawaii, U.S. Navy, U.S. Air Force, Department of Commerce, Department of Homeland Security, Environmental Protection Agency, Federal Aviation Administration, Federal Highways Administration, Department of Agriculture (USDA–Natural Resources Conservation Service (NRCS); USDA–Animal and Plant Health Inspection Service), General Services Administration, Housing and Urban Development, National Oceanic and Atmospheric Administration, U.S. Geological Survey, Hawaii Department of Transportation, State of Hawaii, Housing and Community Development Corporation of Hawaii, and the University of Hawaii. The majority of formal consultations were related to project effects on seabird flyways, nesting by endangered waterbirds, human disturbance such as fire from military training exercises, and research permits. The majority of informal consultations were related to project effects on seabird flyways and nesting by endangered waterbirds. About a quarter of the informal consultations were conducted with the USDA–NRCS for proposed funding for habitat restoration projects under the auspices of the Wildlife Habitat Incentives Program.

Seven 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 adversely affect critical habitat. Of these seven formal consultations, one was conducted on behalf of the Navy in upper Halawa Valley, one was conducted on behalf of the Army regarding routine military training and transformation of the 2nd Brigade 25th Infantry (Light) at six Army installations, and five were conducted on behalf of the Army regarding reinitiation for routine military training at Makua Military Reservation. The Navy consultation involved a retrieval of remains from a remote area crash site in designated plant critical habitat, and although it 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 project regarding training at six Army installations on Oahu is being implemented on lands that we are not exempting from critical habitat in this rule. Five of the Army consultations, those that involve routine military training at Makua Military Reservation, involve actions that are still ongoing. Because these five Federal actions were subject to previous section 7 consultations, there may be a requirement to reinitiate consultation for ongoing Federal projects on these lands.

Sixteen of the 103 informal consultations concerned designated critical habitat, and in all cases we concurred with each agency's determination that the project, as proposed, was not likely to adversely affect critical habitat. These projects were evenly divided between conservation actions that would benefit listed species, changes in labeling on pesticides for use throughout the State to manage conservation areas, and effects on listed species by routine training actions on the Army's Makua Military Reservation. For the 87 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 of 43,491 ac (17,600 ha) of land. Ninety-three percent (40,447 ac (16,369 ha)) of this proposed critical habitat designation is already designated critical habitat for one or more species, and seven percent (3,044 ac (1,231 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 2001, 2002, and 2008 economic analyses of the designation of critical habitat for the Oahu elepaio, 99 species of Oahu plants, 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 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, Honolulu County is not a small governmental jurisdiction because its population was 876,156 residents in 2000. Certain State agencies, such as the Department of Land and Natural Resources and the State Department of Transportation, may be affected by the proposed critical habitat designation. However, for the purposes of the RFA, State governments are considered independent sovereigns, not small governments. The significant overlap between the critical habitat designations for the Oahu elepaio, 99 plant species, and the 12 picture-wing flies and this proposed critical habitat designation may be an indication that this proposal will not have a significant economic impact on a substantial number of small entities. This potential issue will be fully examined in our draft economic analysis.

We have concluded that deferring the RFA finding until completion of the draft economic analysis is necessary to meet the purposes and requirements of the RFA. Deferring the RFA finding in this manner will ensure that we make a sufficiently informed determination based on adequate economic information and provide the necessary opportunity for public comment.

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 will 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; Aid to Families with Dependent Children 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 jeopardize the continued existence of the species, or 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 City and County of Honolulu, 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 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 124 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 rule does not have significant Federalism effects. A Federalism assessment 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 are more clearly defined, and the essential features themselves are specifically identified. While making this definition and identification does not 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 have 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 proposed rule does not contain any new collections of information that require approval by 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 U.S. Court of Appeals 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 position 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 the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. 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 124 Oahu species. Therefore, we have not proposed designation of critical habitat for any of the 124 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. E.O. 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. This proposed rule to designate critical habitat for 124 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 because these areas are not presently used for energy production, and we are unaware of any future plans in this regard. 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 review and revise this assessment as warranted.

References Cited

A complete list of references cited in this proposed 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—[AMENDED]

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

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

2. Amend § 17.11(h), the List of Endangered and Threatened Wildlife by adding entries for ''Damselfly, blackline Hawaiian'', ''Damselfly, crimson Hawaiian'', and ''Damselfly, oceanic Hawaiian'', in alphabetical order under INSECTS, to read as follows:

§ 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						
*	*	*	*	*	*	*	
INSECTS							
*	*	*	*	*	*	*	
Damselfly, blackline Hawaiian.	*Megalagrion nigrohamatum nigrolineatum.*	U.S.A. (HI)	NA	E		17.95(i)	NA
Damselfly, crimson Hawaiian.	*Megalagrion leptodemas.*	U.S.A. (HI)	NA	E		17.95(i)	NA
*	*	*	*	*	*	*	
Damselfly, oceanic Hawaiian.	*Megalagrion oceanicum.*	*U.S.A. (HI)*	*NA*	*E*		*17.95(i)*	*NA*
*	*	*	*	*	*	*	

3. Amend § 17.12(h), the List of Endangered and Threatened Plants, as follows:

a. By removing the entries for *Alsinidendron obovatum, Alsinidendron trinerve, Chamaesyce skottsbergii* var. *kalaeloana, Hedyotis coriacea, Hedyotis degeneri, Hedyotis parvula, Lipochaeta tenuifolia,* and *Mariscus pennatiformis* under FLOWERING PLANTS;

b. By revising the entry for *Achyranthes splendens* var. *rotundata* under FLOWERING PLANTS to read as set forth below;

c. By adding entries for *Bidens amplectens, Chamaesyce skottsbergii* var. *skottsbergii, Cyanea calycina, Cyanea lanceolata, Cyanea purpurellifolia, Cyperus pennatiformis, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra sessilis, Cyrtandra waiolani, Kadua coriacea, Kadua degeneri, Kadua parvula, Korthalsella degeneri, Melanthera tenuifolia, Melicope christophersenii, Melicope hiiakae, Melicope makahae, Platydesma cornuta* var. *cornuta, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Schiedea obovata, Schiedea trinervis, Tetraplasandra lydgatei,* and *Zanthoxylum oahuense* in alphabetical order under FLOWERING PLANTS to read as set forth below;

d. By removing the entry for *Phlegmariurus nutans* under FERNS AND ALLIES; and

e. By adding entries for *Doryopteris takeuchii* and *Huperzia nutans* 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							
*	*	*	*	*	*	*	
Achyranthes splendens var. *rotundata*.	Round-leaved chaff flower.	U.S.A. (HI)	Amaranthaceae	E	220	17.99(i)	NA
*	*	*	*	*	*	*	
Bidens amplectens	Kookoolau	U.S.A. (HI)	Asteraceae	E	.....	17.99(i)	NA
*	*	*	*	*	*	*	
Chamaesyce skottsbergii var. *skottsbergii*.	Ewa Plains akoko ..	U.S.A. (HI)	Euphorbiaceae	E	120	17.99(i)	NA
*	*	*	*	*	*	*	
Cyanea calycina	Haha	U.S.A. (HI)	Campanulaceae	E	.....	17.99(i)	NA
*	*	*	*	*	*	*	
Cyanea lanceolata ..	Haha	U.S.A. (HI)	Campanulaceae	E	.....	17.99(i)	NA
*	*	*	*	*	*	*	
Cyanea purpurellifolia.	Haha	U.S.A. (HI)	Campanulaceae	E	.....	17.99(i)	NA
*	*	*	*	*	*	*	
Cyperus pennatiformis.	None	U.S.A. (HI)	Cyperaceae	E	559	17.99(a)(1), (e)(1), (g), and (i).	NA
*	*	*	*	*	*	*	
Cyrtandra gracilis ...	Haiwale	U.S.A. (HI)	Gesneriaceae	E	.....	17.99(i)	NA
Cyrtandra kaulantha	Haiwale	U.S.A. (HI)	Gesneriaceae	E	.....	17.99(i)	NA
*	*	*	*	*	*	*	
Cyrtandra sessilis ...	Haiwale	U.S.A. (HI)	Gesneriaceae	E	.....	17.99(i)	NA
*	*	*	*	*	*	*	
Cyrtandra waiolani ..	Haiwale	U.S.A. (HI)	Gesneriaceae	E	.....	17.99(i)	NA
*	*	*	*	*	*	*	
Kadua coriacea	Kioele	U.S.A. (HI)	Rubiaceae	E	467	17.99(e)(1) and (i).	NA
*	*	*	*	*	*	*	
Kadua degeneri	None	U.S.A. (HI)	Rubiaceae	E	448	17.99(i)	NA
*	*	*	*	*	*	*	
Kadua parvula	None	U.S.A. (HI)	Rubiaceae	E	448	17.99(i)	NA
*	*	*	*	*	*	*	
Korthalsella degeneri.	Hulumoa	U.S.A. (HI)	Viscaceae	E	.....	17.99(i)	NA
*	*	*	*	*	*	*	
Melanthera tenuifolia.	Nehe	U.S.A. (HI)	Asteraceae	E	448	17.99(i)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*	*	*
Melicope christophersenii	Alani	U.S.A. (HI)	Rutaceae	E		17.99(i)	NA
*	*	*	*	*	*	*	*
Melicope hiiakae	Alani	U.S.A. (HI)	Rutaceae	E		17.99(i)	NA
*	*	*	*	*	*	*	*
Melicope makahae	Alani	U.S.A. (HI)	Rutaceae	E		17.99(i)	NA
*	*	*	*	*	*	*	*
Platydesma cornuta var. *cornuta*	None	U.S.A. (HI)	Rutaceae	E		17.99(i)	NA
Platydesma cornuta var. *decurrens*	None	U.S.A. (HI)	Rutaceae	E		17.99(i)	NA
*	*	*	*	*	*	*	*
Pleomele forbesii	Hala pepe	U.S.A. (HI)	Asparagaceae	E		17.99(i)	NA
*	*	*	*	*	*	*	*
Psychotria hexandra ssp. *oahuensis*	Kopiko	U.S.A. (HI)	Rubiaceae	E		17.99(i)	NA
*	*	*	*	*	*	*	*
Pteralyxia macrocarpa	Kaulu	U.S.A. (HI)	Apocynaceae	E		17.99(i)	NA
*	*	*	*	*	*	*	*
Schiedea obovata	None	U.S.A. (HI)	Caryophyllaceae	E	448	17.99(i)	NA
*	*	*	*	*	*	*	*
Schiedea trinervis	None	U.S.A. (HI)	Caryophyllaceae	E	448	17.99(i)	NA
*	*	*	*	*	*	*	*
Tetraplasandra lydgatei	None	U.S.A. (HI)	Araliaceae	E		17.99(i)	NA
*	*	*	*	*	*	*	*
Zanthoxylum oahuense	Ae	U.S.A. (HI)	Rutaceae	E		17.99(i)	NA
*	*	*	*	*	*	*	*
FERNS AND ALLIES							
*	*	*	*	*	*	*	*
Doryopteris takeuchii	None	U.S.A. (HI)	Pteridaceae	E		17.99(i)	NA
*	*	*	*	*	*	*	*
Huperzia nutans	Wawaeiole	U.S.A. (HI)	Lycopodiaceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	*

4. Amend § 17.95 paragraph (i), by adding critical habitat for ''Blackline Hawaiian Damselfly (*Megalagrion nigrohamatum nigrolineatum*)'', ''Crimson Hawaiian Damselfly (*Megalagrion leptodemas*)'', and ''Oceanic Hawaiian Damselfly (*Megalagrion oceanicum*)'', in the same alphabetical order as these species occur in the table at § 17.11(h), to read as set forth below.

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(i) *Insects.*

* * * * *

Blackline Hawaiian damselfly (*Megalagrion nigrohamatum nigrolineatum*)

(1) Critical habitat units are depicted for Honolulu County, Hawaii, on the maps below.

(2) *Primary constituent elements.* The primary constituent elements of critical habitat for the blackline Hawaiian damselfly (*Megalagrion nigrohamatum nigrolineatum*) 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.*

(vii) Perennial streams.

(viii) Slow reaches of streams.

(ix) Pools.

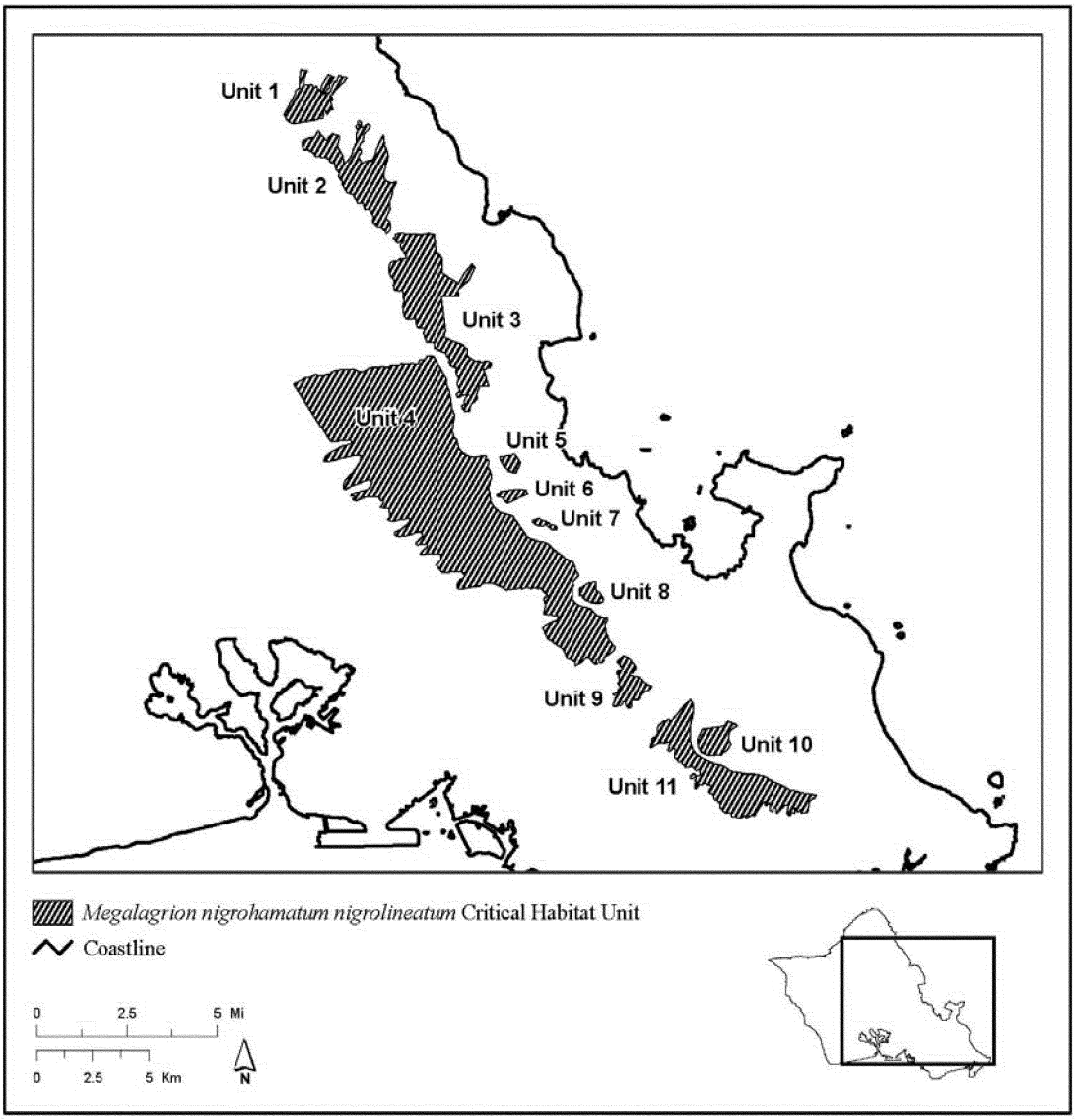
(3) Existing manmade features and structures, such as buildings, roads, railroads, airports, runways, other paved areas, lawns, and other urban landscaped areas, do not contain one or more of the physical and biological features. Federal actions limited to those areas, therefore, would not trigger a consultation under section 7 of the Act unless they may affect the species or 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 blackline Hawaiian damselfly (*Megalagrion nigrohamatum nigrolineatum*) follows:

BILLING CODE 4310–55–P

Map 1
***Megalagrion nigrohamatum nigrolineatum*–Index Map**



(6) *Megalagrion nigrohamatum nigrolineatum*—Unit 1—Lowland Wet, Honolulu County, Hawaii (790 ac; 320 ha); *Megalagrion nigrohamatum nigrolineatum*—Unit 2—Lowland Wet, Honolulu County, Hawaii (1,790 ac; 724 ha); and *Megalagrion nigrohamatum nigrolineatum*—Unit 3—Lowland Wet, Honolulu County, Hawaii (3,041 ac; 1,231 ha).

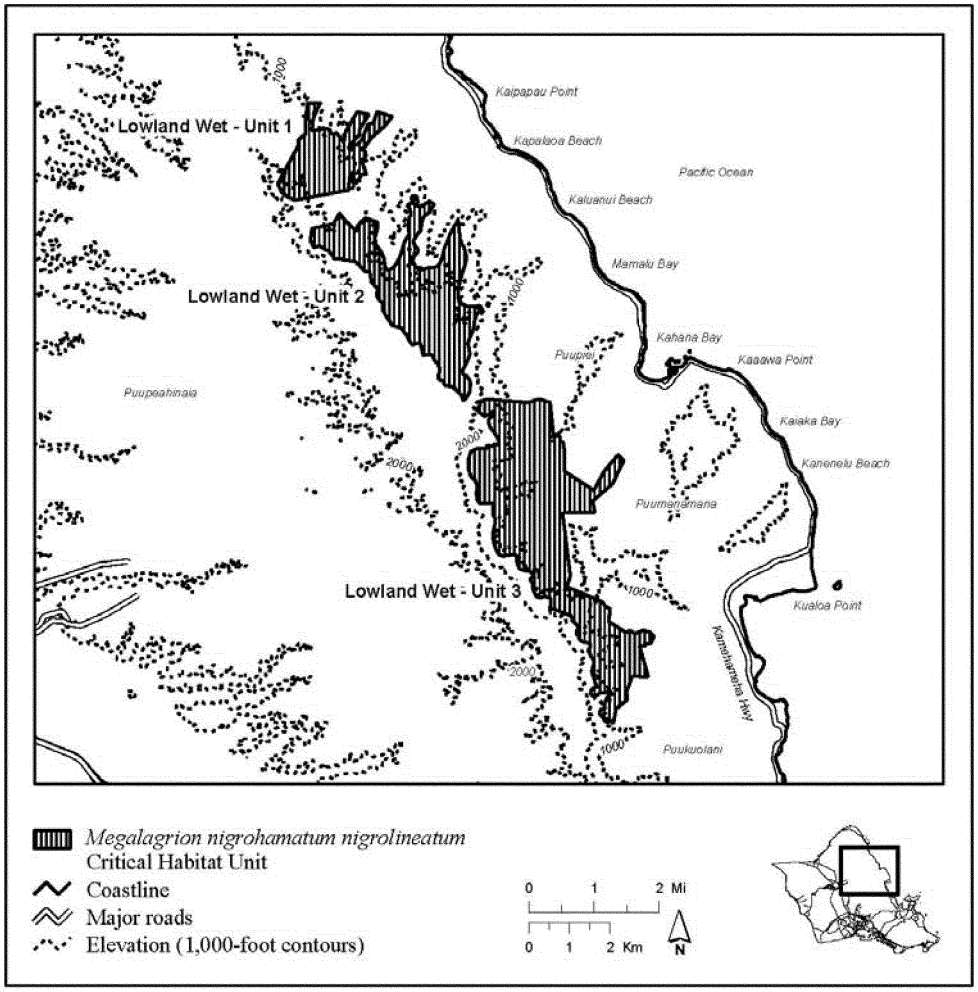
(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.*

(ii) [Reserved for textual description of Unit 2.] This unit is critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.*

(iii) [Reserved for textual description of Unit 3.] This unit is critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.*

(iv) **Note:** Map of *Megalagrion nigrohamatum nigrolineatum*—Unit 1—Lowland Wet, *Megalagrion nigrohamatum nigrolineatum*—Unit 2—Lowland Wet, and *Megalagrion nigrohamatum nigrolineatum*—Unit 3—Lowland Wet follows:

Megalagrion nigrohamatum nigrolineatum
Lowland Wet
Unit 1, Unit 2 and Unit 3

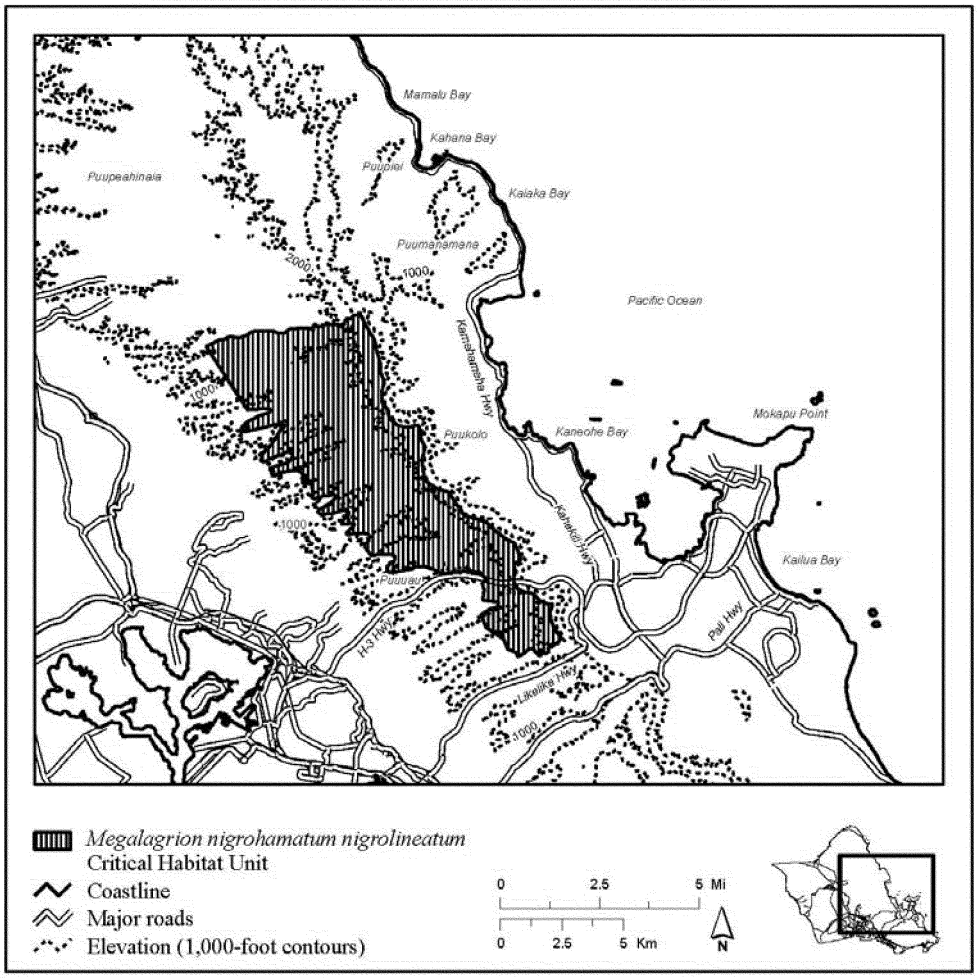


(7) *Megalagrion nigrohamatum nigrolineatum*—Unit 4—Lowland Wet, Honolulu County, Hawaii (15,728 ac; 6,365 ha).

(i) [Reserved for textual description of unit 4.] This unit is critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.*

(ii) **Note:** Map of *Megalagrion nigrohamatum nigrolineatum*—Unit 4—Lowland Wet follows:

Megalagrion nigrohamatum nigrolineatum
Lowland Wet
Unit 4



(8) *Megalagrion nigrohamatum nigrolineatum*–Unit 5—Lowland Wet, Honolulu County, Hawaii (124 ac; 50 ha); *Megalagrion nigrohamatum nigrolineatum*—Unit 6—Lowland Wet, Honolulu County, Hawaii (124 ac; 50 ha); and *Megalagrion nigrohamatum nigrolineatum*—Unit 7—Lowland Wet, Honolulu County, Hawaii (53 ac; 21 ha).

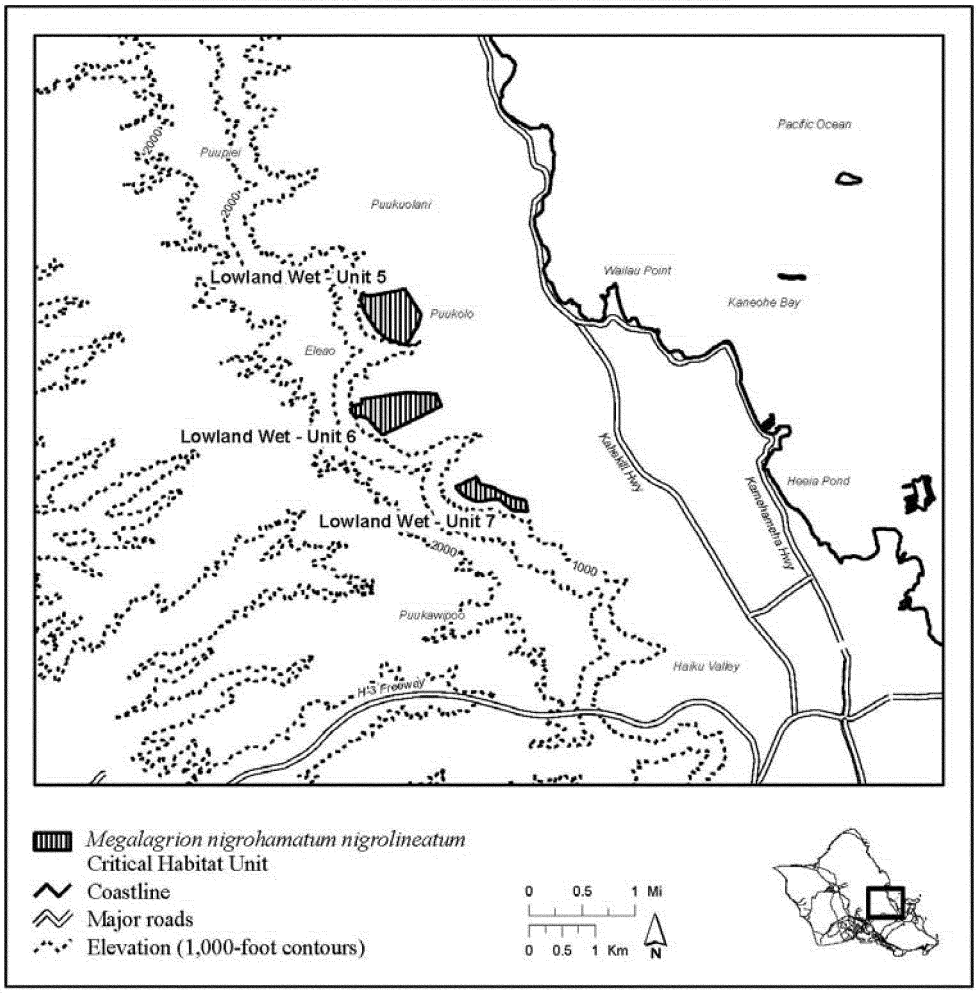
(i) [Reserved for textual description of Unit 5.] This unit is critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.*

(ii) [Reserved for textual description of Unit 6.] This unit is critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.*

(iii) [Reserved for textual description of Unit 7.] This unit is critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.*

(iv) **Note:** Map of *Megalagrion nigrohamatum nigrolineatum*—Unit 5—Lowland Wet, *Megalagrion nigrohamatum nigrolineatum*—Unit 6—Lowland Wet, and *Megalagrion nigrohamatum nigrolineatum*—Unit 7—Lowland Wet follows:

Megalagrion nigrohamatum nigrolineatum
Lowland Wet
Unit 5, Unit 6 and Unit 7



(9) *Megalagrion nigrohamatum nigrolineatum*—Unit 8—Lowland Wet, Honolulu County, Hawaii (161 ac; 65 ha); *Megalagrion nigrohamatum nigrolineatum*—Unit 9—Lowland Wet, Honolulu County, Hawaii (478 ac; 193 ha); *Megalagrion nigrohamatum nigrolineatum*—Unit 10—Lowland Wet, Honolulu County, Hawaii (407 ac; 165 ha); and *Megalagrion nigrohamatum nigrolineatum*—Unit 11—Lowland Wet, Honolulu County, Hawaii (2,507 ac; 1,014 ha).

(i) [Reserved for textual description of Unit 8.] This unit is critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.*

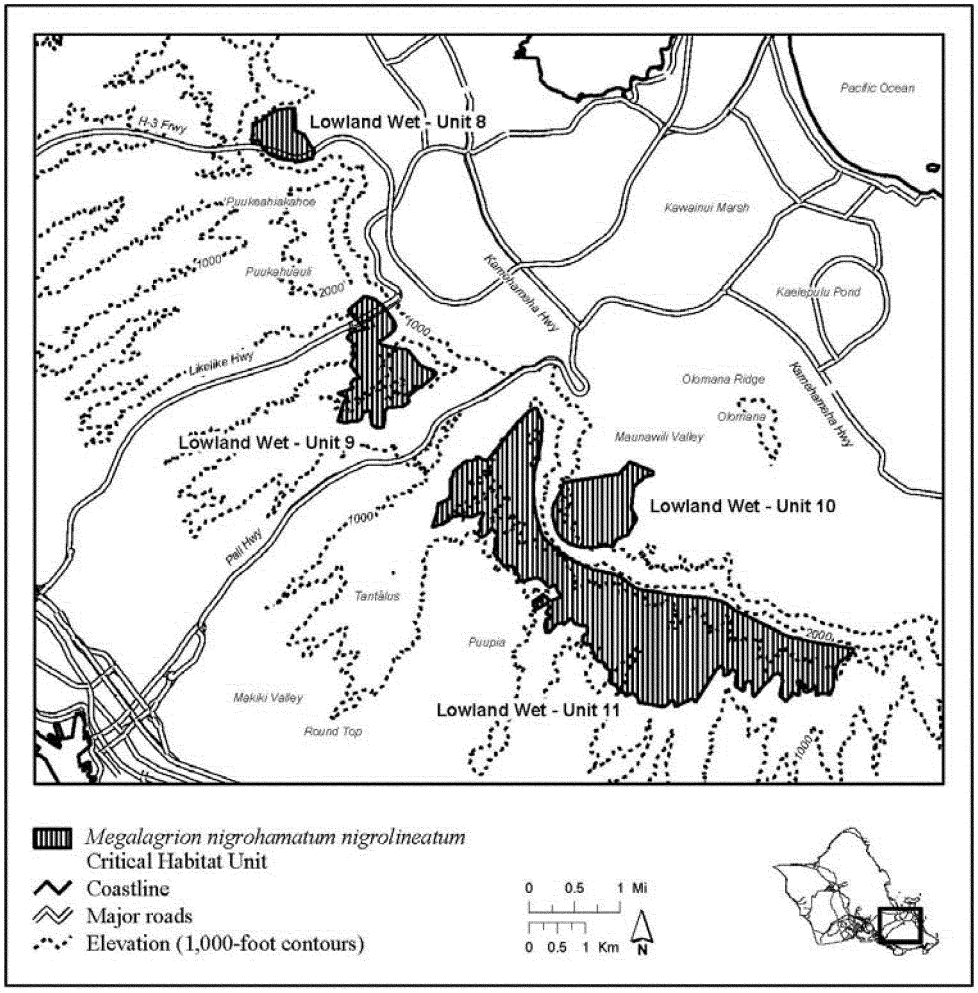
(ii) [Reserved for textual description of Unit 9.] This unit is critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.*

(iii) [Reserved for textual description of Unit 10.] This unit is critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.*

(iv) [Reserved for textual description of Unit 11.] This unit is critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.*

(v) **Note:** Map of *Megalagrion nigrohamatum nigrolineatum*—Unit 8—Lowland Wet, *Megalagrion nigrohamatum nigrolineatum*—Unit 9—Lowland Wet, *Megalagrion nigrohamatum nigrolineatum*—Unit 10—Lowland Wet, and *Megalagrion nigrohamatum nigrolineatum*—Unit 11—Lowland Wet follows:

Megalagrion nigrohamatum nigrolineatum
Lowland Wet
Unit 8, Unit 9, Unit 10 and Unit 11



Crimson Hawaiian damselfly (*Megalagrion leptodemas*)

(1) Critical habitat units are depicted for Honolulu County, Hawaii, on the maps below.

(2) *Primary constituent elements.*

(i) In units 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11, the primary constituent elements of critical habitat for the crimson Hawaiian damselfly 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.*

(G) Perennial streams.

(H) Slow reaches of streams or ponds.

(ii) In units 12, 13, and 14, the primary constituent elements of critical habitat for the crimson Hawaiian damselfly 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: Ferns, Bryophytes, *Coprosma, Dubautia, Kadua, Peperomia.*

(G) Perennial streams.

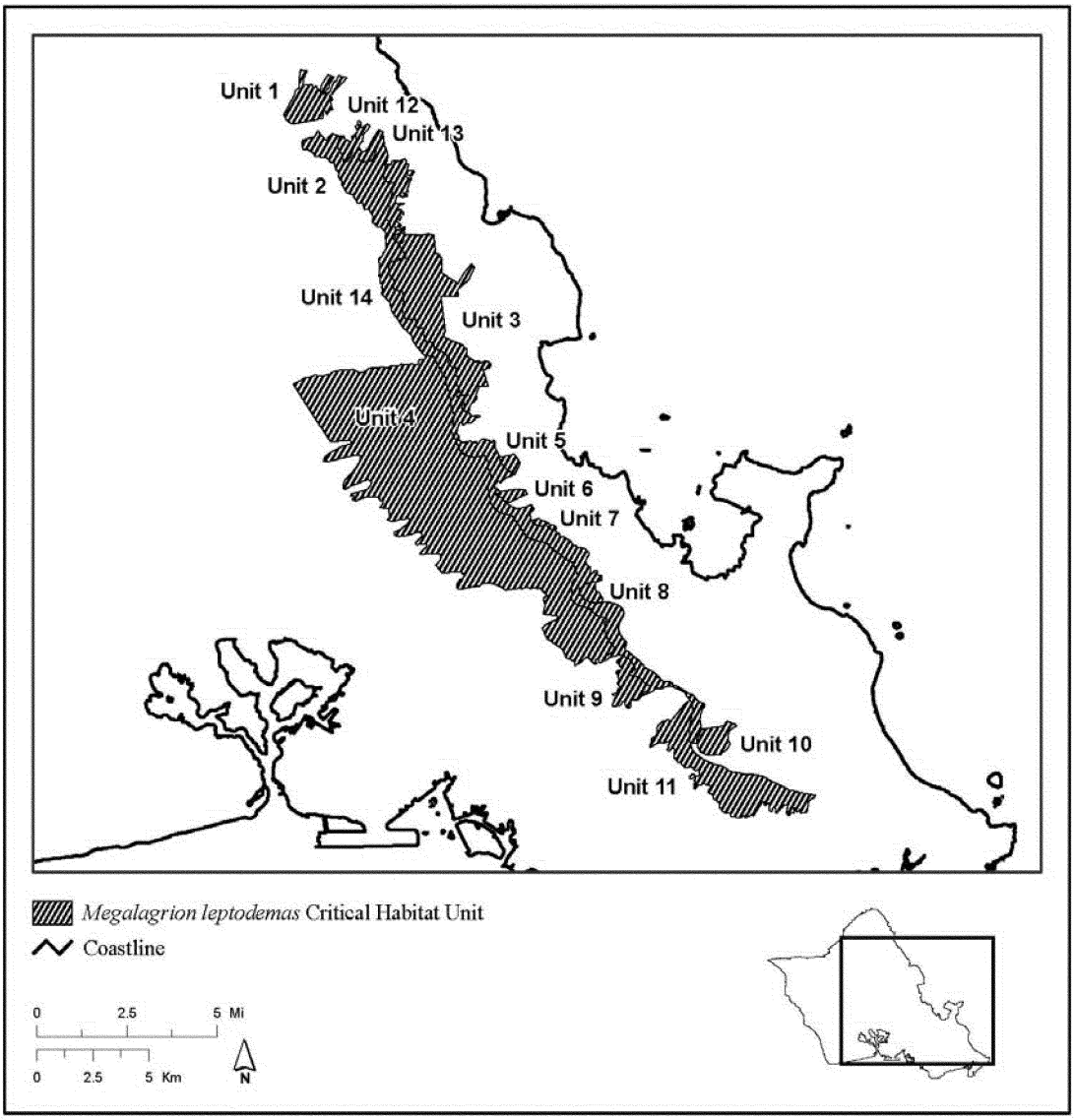
(H) Slow reaches of streams or ponds.

(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 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.

(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 crimson Hawaiian damselfly (*Megalagrion leptodemas*) follows:

Map 1
***Megalagrion leptodemas*–Index Map**



(6) *Megalagrion leptodemas*—Unit 1—Lowland Wet, Honolulu County, Hawaii (790 ac; 320 ha); *Megalagrion leptodemas*—Unit 2—Lowland Wet, Honolulu County, Hawaii (1,790 ac; 724 ha); and *Megalagrion leptodemas*—Unit 3—Lowland Wet, Honolulu County, Hawaii (3,041 ac; 1,231 ha).

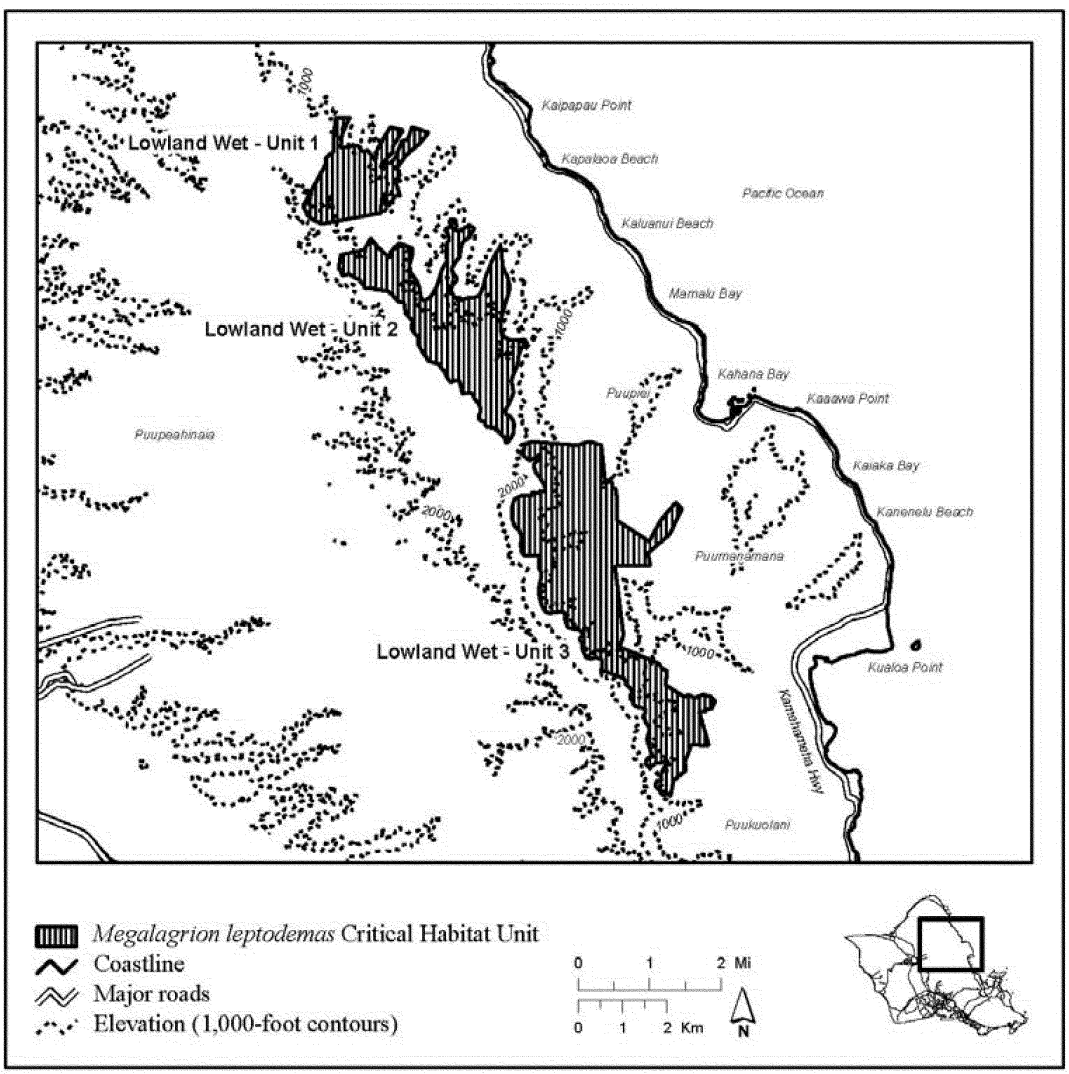
(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(ii) [Reserved for textual description of Unit 2.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(iii) [Reserved for textual description of Unit 3.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(iv) **Note:** Map of *Megalagrion leptodemas*—Unit 1—Lowland Wet, *Megalagrion leptodemas*—Unit 2—Lowland Wet, and *Megalagrion leptodemas*—Unit 3—Lowland Wet follows:

Megalagrion leptodemas
Lowland Wet
Unit 1, Unit 2 and Unit 3

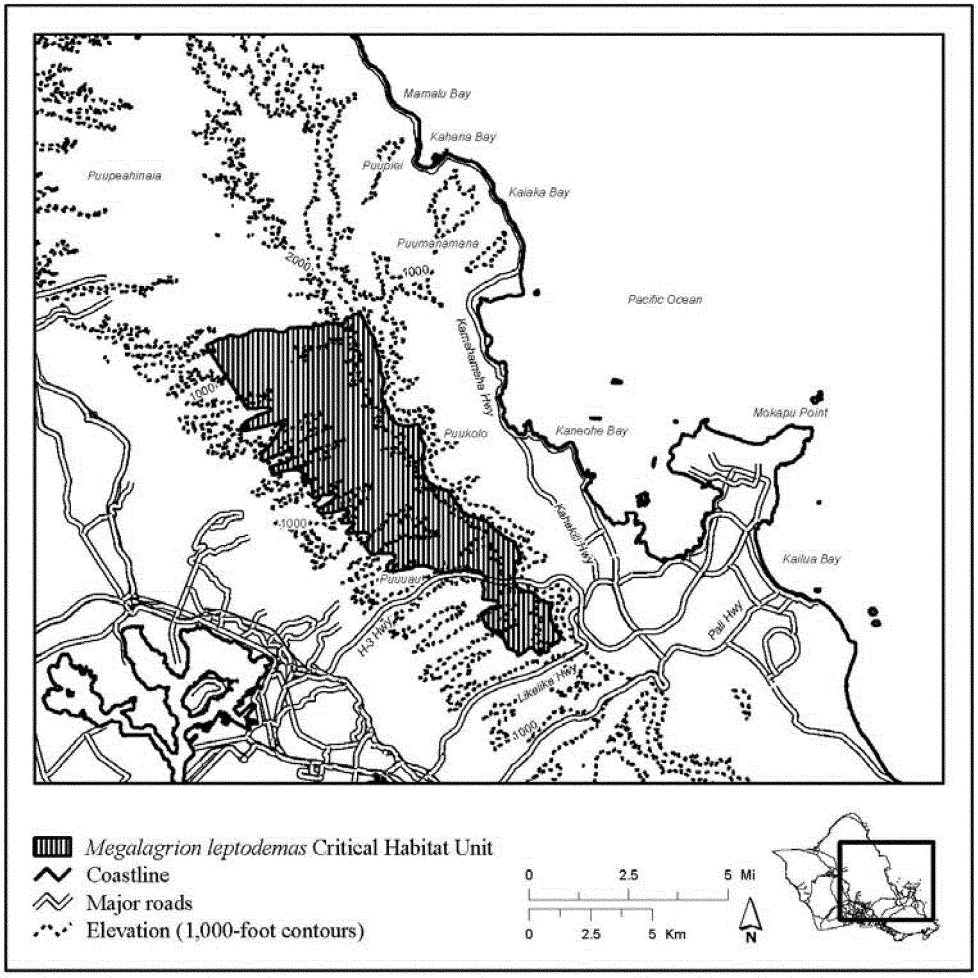


(7) *Megalagrion leptodemas*—Unit 4—Lowland Wet, Honolulu County, Hawaii (15,728 ac; 6,365 ha).

(i) [Reserved for textual description of unit.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(ii) **Note:** Map of *Megalagrion leptodemas*—Unit 4—Lowland Wet follows:

Megalagrion leptodemas
Lowland Wet
Unit 4



(8) *Megalagrion leptodemas*—Unit 5—Lowland Wet, Honolulu County, Hawaii (124 ac; 50 ha); *Megalagrion leptodemas*—Unit 6—Lowland Wet, Honolulu County, Hawaii (124 ac; 50 ha); and *Megalagrion leptodemas*—Unit 7—Lowland Wet, Honolulu County, Hawaii (53 ac; 21 ha).

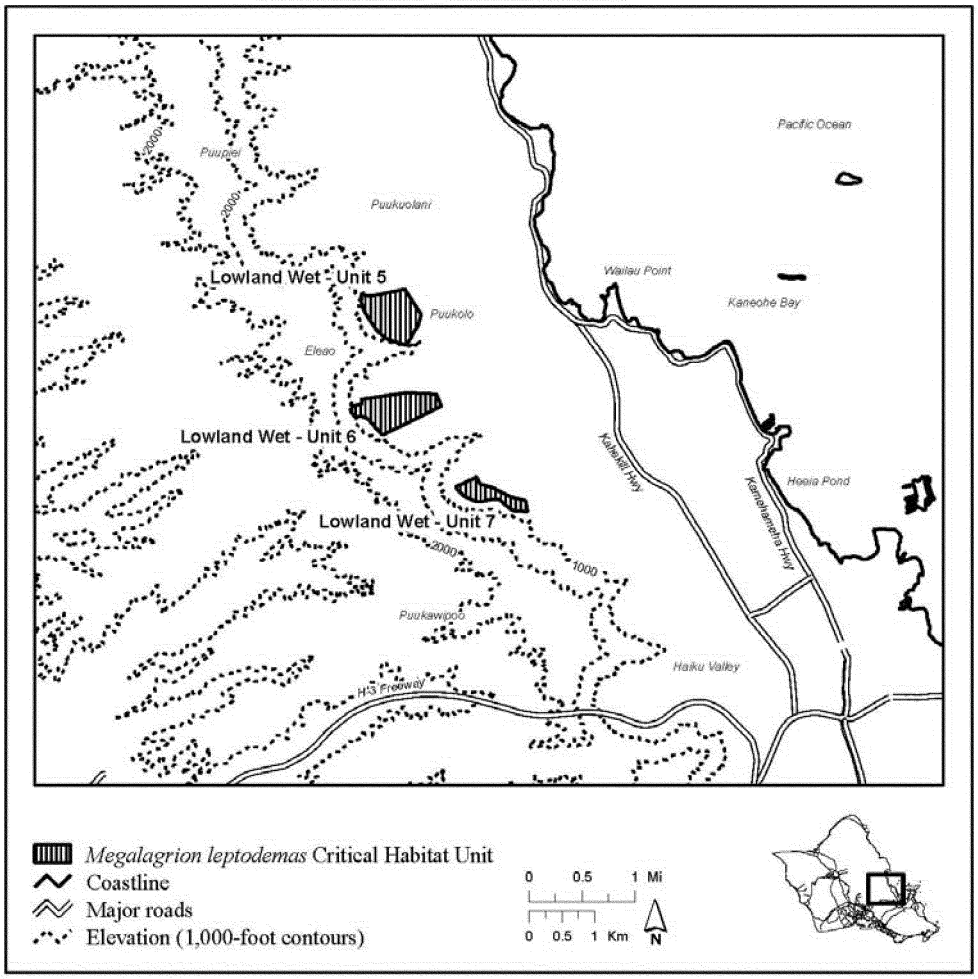
(i) [Reserved for textual description of Unit 5.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(ii) [Reserved for textual description of Unit 6.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(iii) [Reserved for textual description of Unit 7.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(iv) **Note:** Map of *Megalagrion leptodemas*—Unit 5—Lowland Wet, *Megalagrion leptodemas*—Unit 6—Lowland Wet, and *Megalagrion leptodemas*—Unit 7—Lowland Wet follows:

Megalagrion leptodemas
Lowland Wet
Unit 5, Unit 6 and Unit 7



(9) *Megalagrion leptodemas*—Unit 8—Lowland Wet, Honolulu County, Hawaii (161 ac; 65 ha); *Megalagrion leptodemas*—Unit 9—Lowland Wet, Honolulu County, Hawaii (478 ac; 193 ha); *Megalagrion leptodemas*—Unit 10—Lowland Wet, Honolulu County, Hawaii (407 ac; 165 ha); and *Megalagrion leptodemas*—Unit 11—Lowland Wet, Honolulu County, Hawaii (2,507 ac; 1,014 ha)

(i) [Reserved for textual description of Unit 8.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

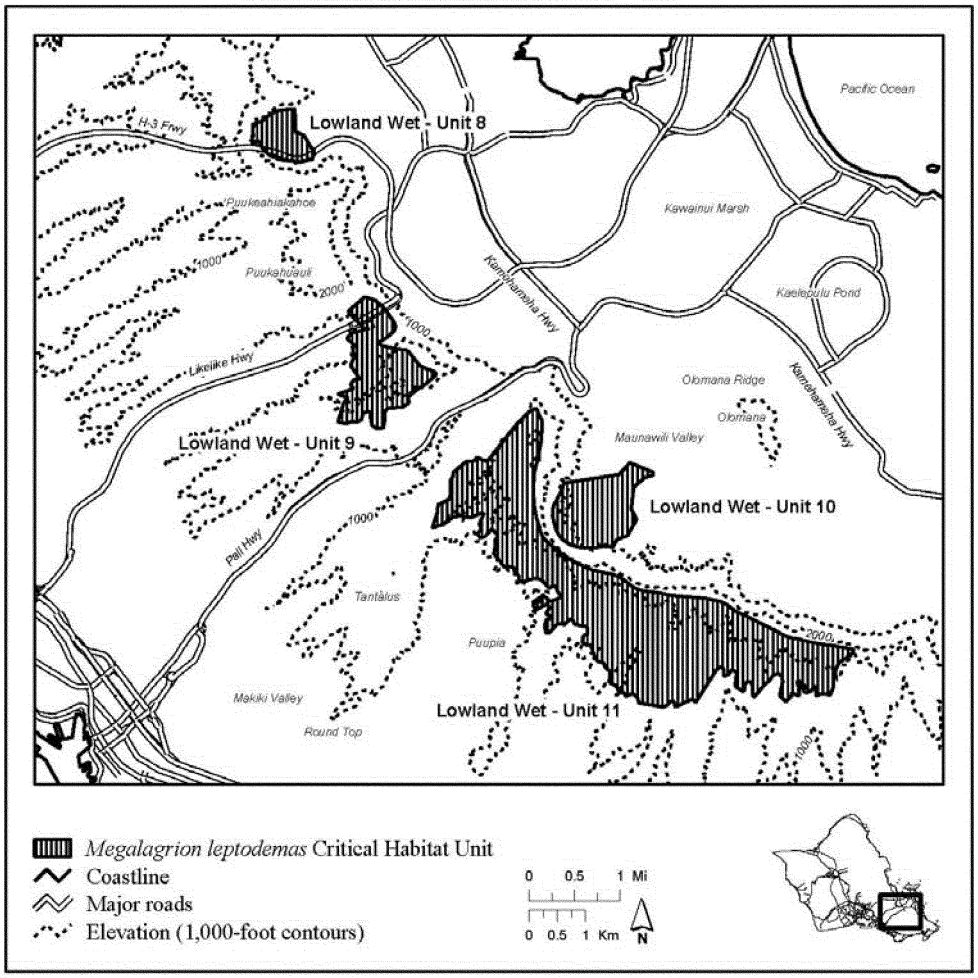
(ii) [Reserved for textual description of Unit 9.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(iii) [Reserved for textual description of Unit 10.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(iv) [Reserved for textual description of Unit 11.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(v) **Note:** Map of *Megalagrion leptodemas*—Unit 8—Lowland Wet, *Megalagrion leptodemas*—Unit 9—Lowland Wet, *Megalagrion leptodemas*—Unit 10—Lowland Wet, and *Megalagrion leptodemas*—Unit 11—Lowland Wet follows:

Megalagrion leptodemas
Lowland Wet
Unit 8, Unit 9, Unit 10 and Unit 11



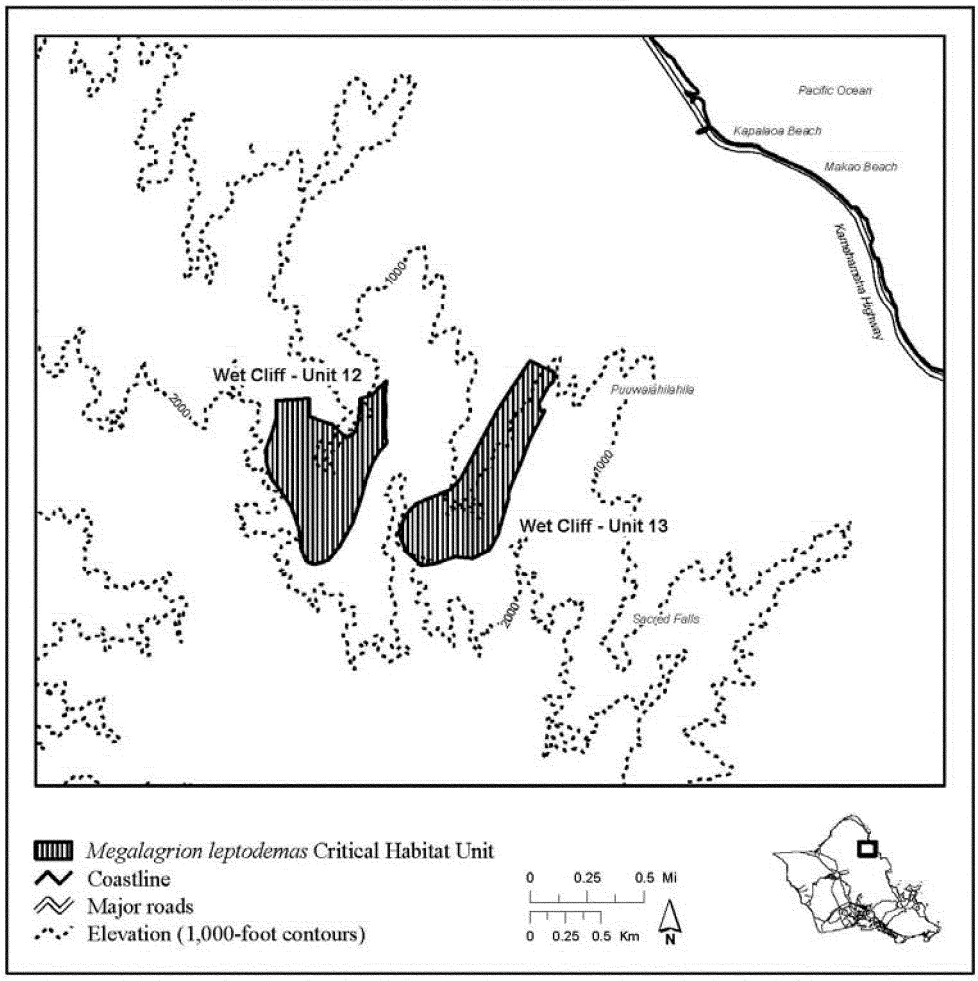
(10) *Megalagrion leptodemas*—Unit 12—Wet Cliff, Honolulu County, Hawaii (151 ac; 61 ha) and *Megalagrion leptodemas*—Unit 13—Wet Cliff, Honolulu County, Hawaii (144 ac; 58 ha).

(i) [Reserved for textual description of Unit 12.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(ii) [Reserved for textual description of Unit 13.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(iii) **Note:** Map of *Megalagrion leptodemas*—Unit 12—Wet Cliff and *Megalagrion leptodemas*—Unit 13—Wet Cliff follows:

Megalagrion leptodemas
Wet Cliff
Unit 12 and Unit 13

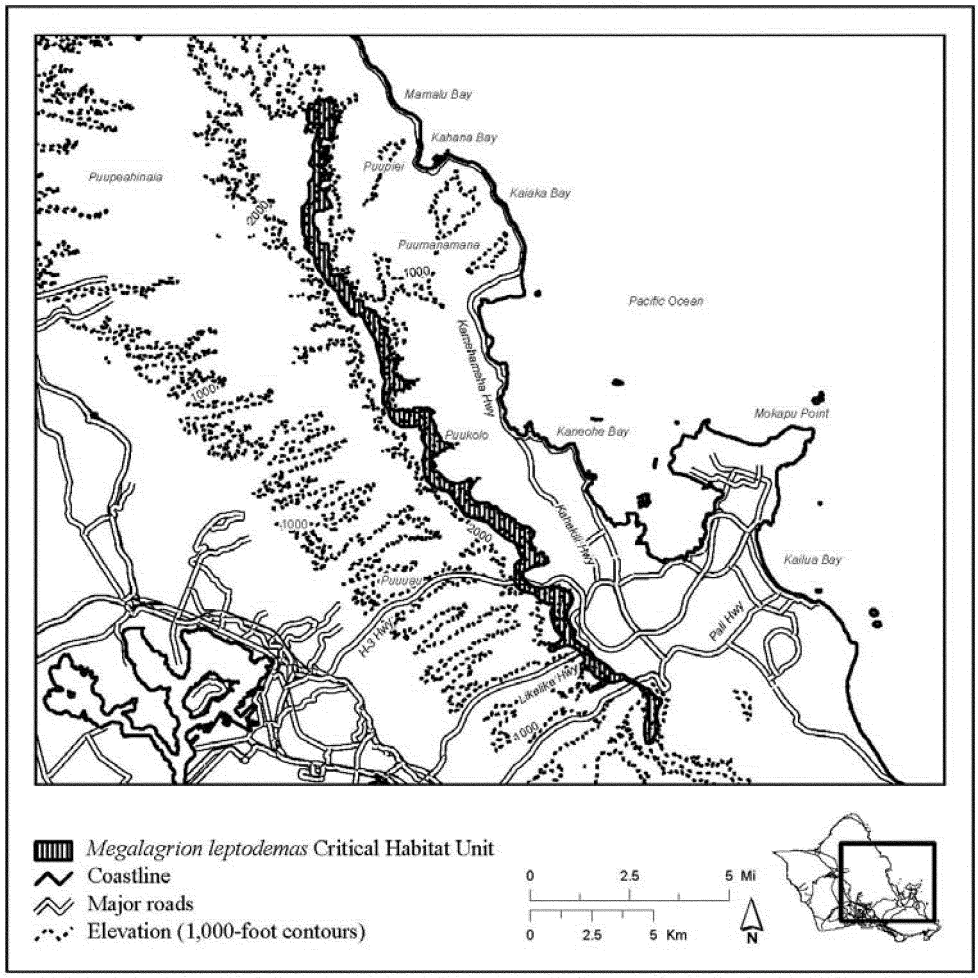


(11) *Megalagrion leptodemas*—Unit 14—Wet Cliff, Honolulu County, Hawaii (4,649 ac; 1,881 ha).

(i) [Reserved for textual description of unit.] This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

(ii) **Note:** Map of *Megalagrion leptodemas*—Unit 14—Wet Cliff follows:

Megalagrion leptodemas
Wet Cliff
Unit 14



Oceanic Hawaiian damselfly (*Megalagrion oceanicum*)

(1) Critical habitat units are depicted for Honolulu County, Hawaii, on the maps below.

(2) *Primary constituent elements.*

(i) In unit 1, the primary constituent elements of critical habitat for the oceanic Hawaiian damselfly (*Megalagrion oceanicum*) 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.*

(G) Perennial streams.

(H) Swift-flowing sections and riffles of streams.

(ii) In units 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, the primary constituent elements of critical habitat for the oceanic Hawaiian damselfly (*Megalagrion oceanicum*) 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.*

(G) Perennial streams.

(H) Swift-flowing sections and riffles of streams.

(iii) In units 13, 14, and 15, the primary constituent elements of critical habitat for the oceanic Hawaiian damselfly (*Megalagrion oceanicum*) 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: Ferns, Bryophytes, *Coprosma, Dubautia, Kadua, Peperomia.*

(G) Perennial streams.

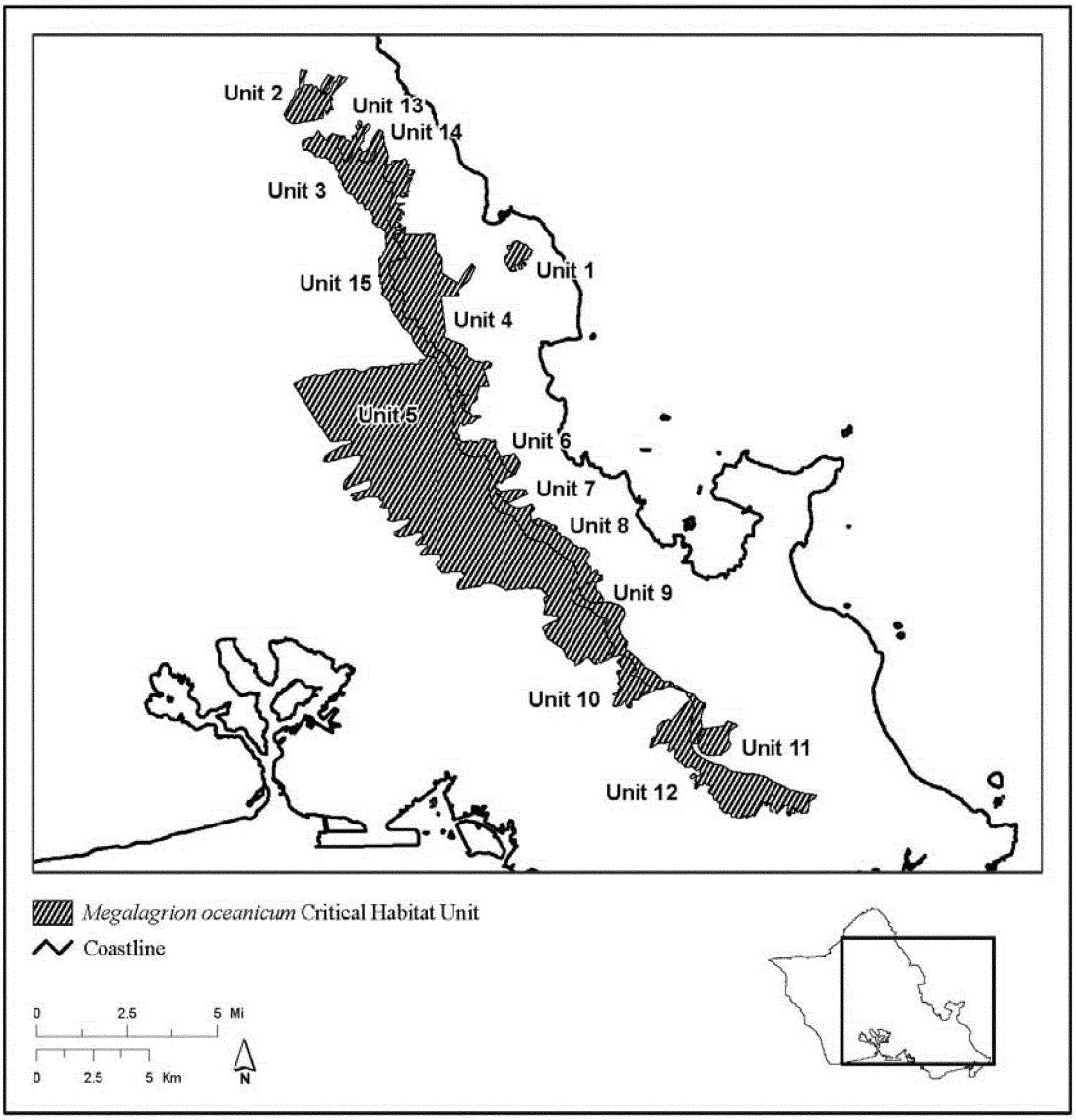
(I) Swift-flowing sections and riffles of streams.

(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 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 and 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 oceanic Hawaiian damselfly (*Megalagrion oceanicum;* Map 1) follows:

Map 1
***Megalagrion oceanicum*–Index Map**

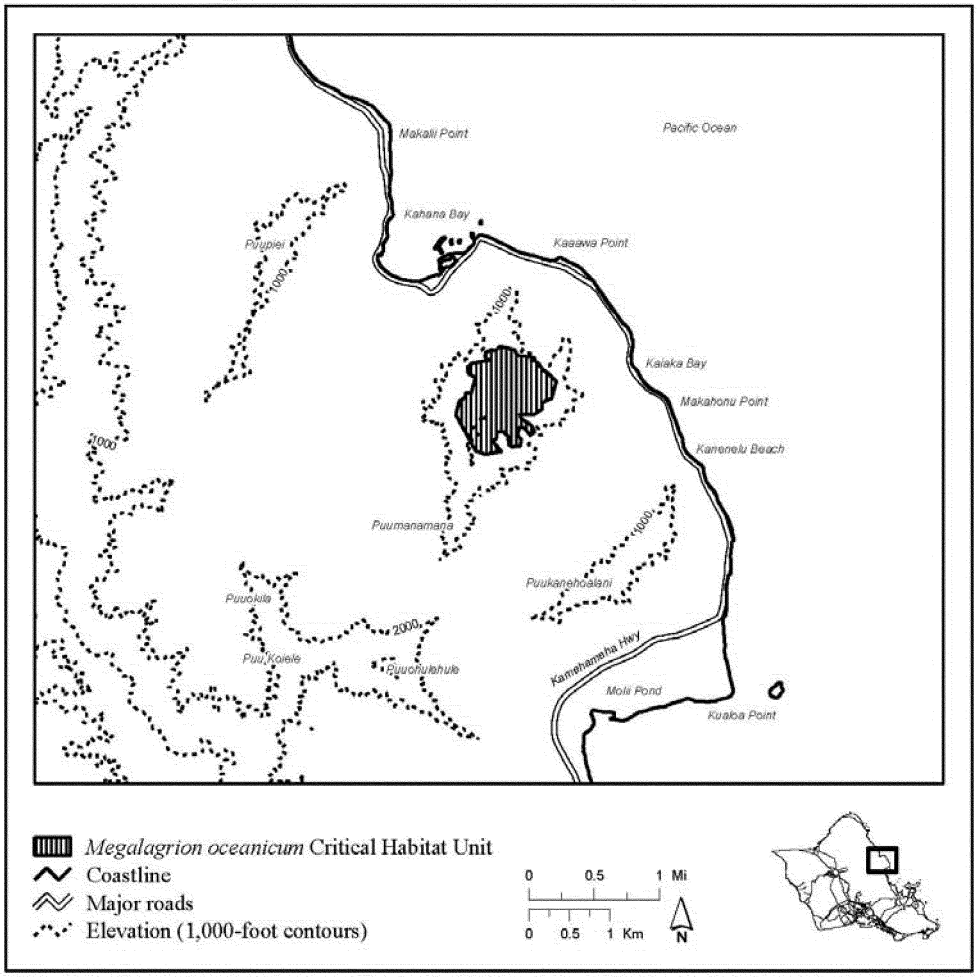


(6) *Megalagrion oceanicum*—Unit 1—Lowland Mesic, Honolulu County, Hawaii (247 ac; 100 ha).

(i) [Reserved for textual description of unit.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(ii) **Note:** Map of *Megalagrion oceanicum*—Unit 1—Lowland Mesic (Map 2) follows:

Megalagrion oceanicum
Lowland Mesic
Unit 1



(7) *Megalagrion oceanicum*—Unit 2—Lowland Wet, Honolulu County, Hawaii (790 ac; 320 ha); *Megalagrion oceanicum*—Unit 3—Lowland Wet, Honolulu County, Hawaii (1,790 ac; 724 ha); and *Megalagrion oceanicum*—Unit 4—Lowland Wet, Honolulu County, Hawaii (3,041 ac; 1,231 ha).

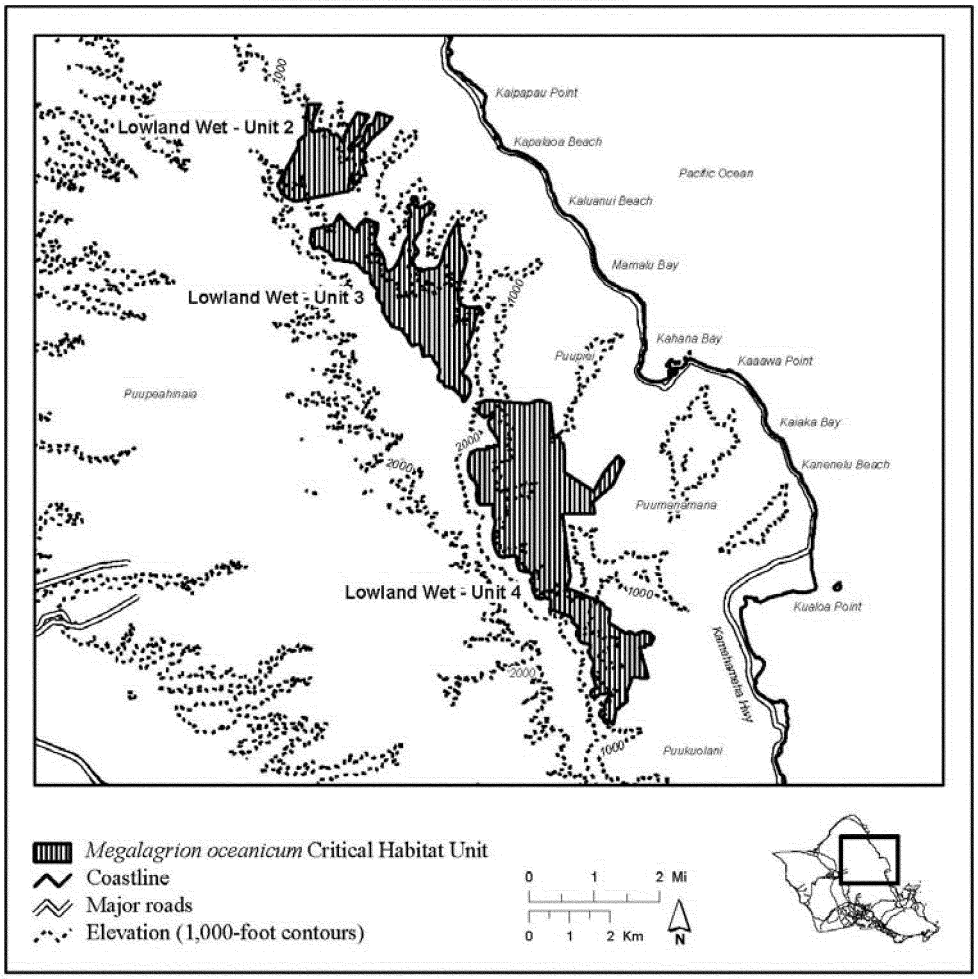
(i) [Reserved for textual description of Unit 2.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(ii) [Reserved for textual description of Unit 3.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(iii) [Reserved for textual description of Unit 4.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(iv) **Note:** Map of *Megalagrion oceanicum*—Unit 2—Lowland Wet, *Megalagrion oceanicum*—Unit 3—Lowland Wet, and *Megalagrion oceanicum*—Unit 4—Lowland Wet follows:

Megalagrion oceanicum
Lowland Wet
Unit 2, Unit 3 and Unit 4

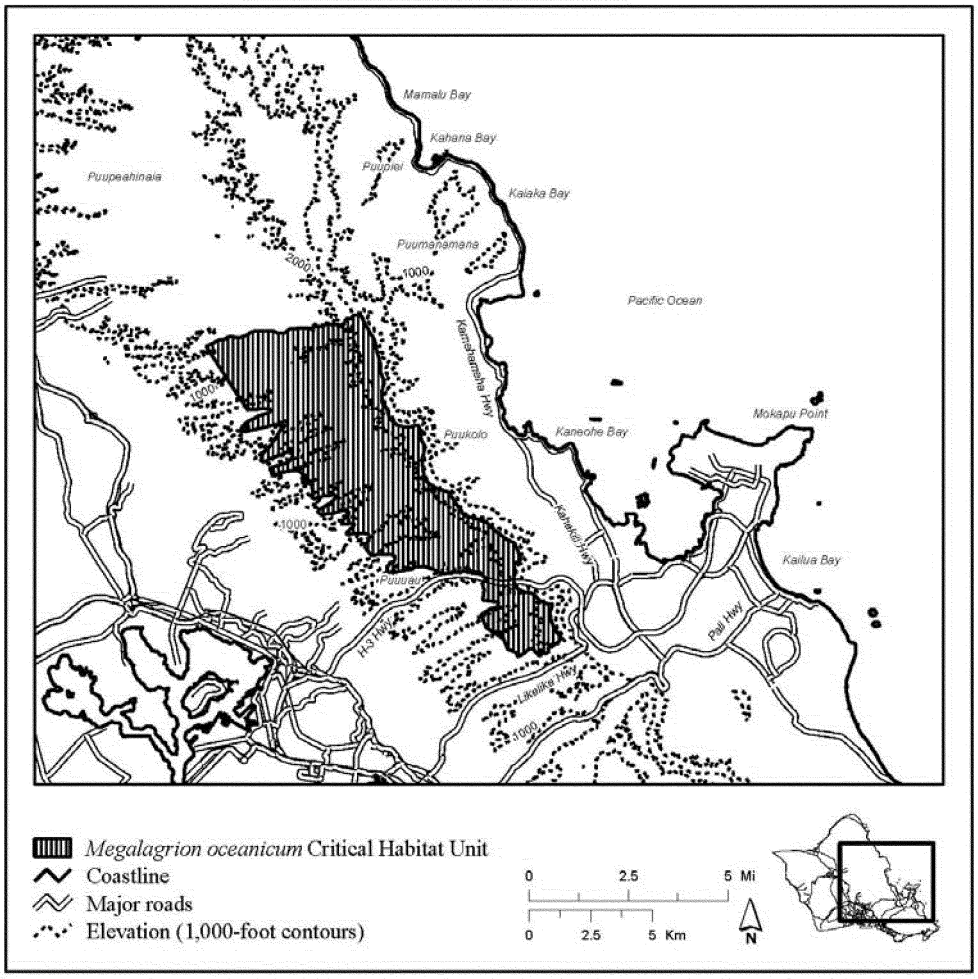


(8) *Megalagrion oceanicum*—Unit 5—Lowland Wet, Honolulu County, Hawaii (15,728 ac; 6,365 ha).

(i) [Reserved for textual description of unit.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(ii) **Note:** Map of *Megalagrion oceanicum*—Unit 5—Lowland Wet follows:

Megalagrion oceanicum
Lowland Wet
Unit 5



(9) *Megalagrion oceanicum*—Unit 6—Lowland Wet, Honolulu County, Hawaii (124 ac; 50 ha); *Megalagrion oceanicum*—Unit 7—Lowland Wet, Honolulu County, Hawaii (124 ac; 50 ha); and *Megalagrion oceanicum*—Unit 8—Lowland Wet, Honolulu County, Hawaii (53 ac; 21 ha).

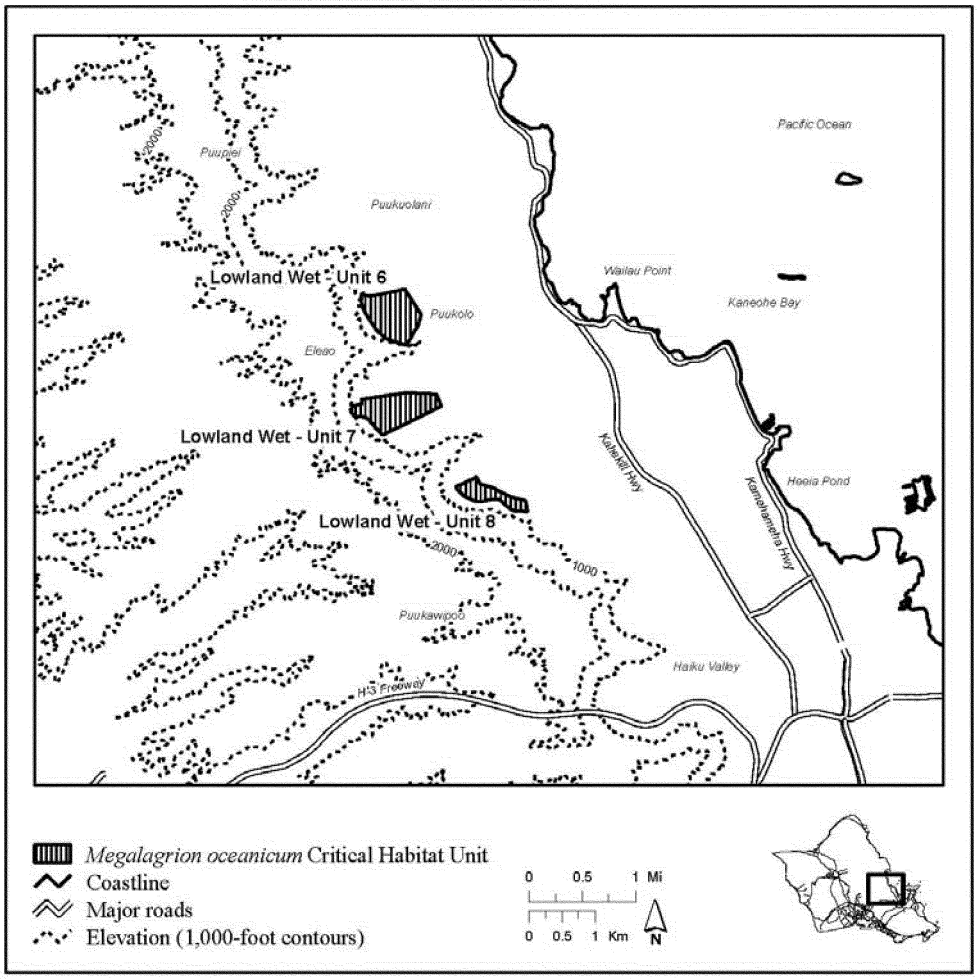
(i) [Reserved for textual description of Unit 6.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(ii) [Reserved for textual description of Unit 7.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(iii) [Reserved for textual description of Unit 8.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(iv) **Note:** Map of *Megalagrion oceanicum*—Unit 6—Lowland Wet, *Megalagrion oceanicum*—Unit 7—Lowland Wet, and *Megalagrion oceanicum*—Unit 8—Lowland Wet follows:

Megalagrion oceanicum
Lowland Wet
Unit 6, Unit 7 and Unit 8



(10) *Megalagrion oceanicum*—Unit 9—Lowland Wet, Honolulu County, Hawaii (161 ac; 65 ha); *Megalagrion oceanicum*—Unit 10—Lowland Wet, Honolulu County, Hawaii (478 ac; 193 ha); *Megalagrion oceanicum*—Unit 11—Lowland Wet, Honolulu County, Hawaii (407 ac; 165 ha); and *Megalagrion oceanicum*—Unit 12—Lowland Wet, Honolulu County, Hawaii (2,507 ac; 1,014 ha).

(i) [Reserved for textual description of Unit 9.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

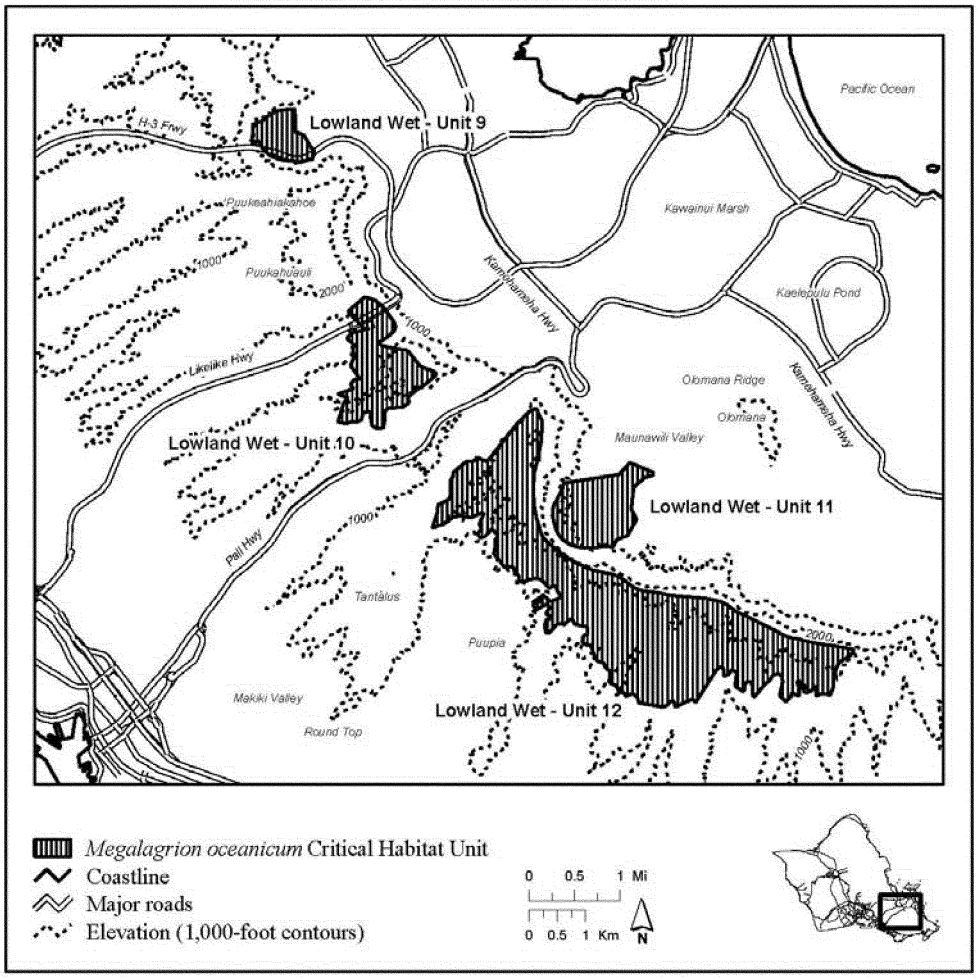
(ii) [Reserved for textual description of Unit 10.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(iii) [Reserved for textual description of Unit 11.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(iv) [Reserved for textual description of Unit 12.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(v) **Note:** Map of *Megalagrion oceanicum*—Unit 9—Lowland Wet, *Megalagrion oceanicum*—Unit 10—Lowland Wet, *Megalagrion oceanicum*—Unit 11—Lowland Wet, and *Megalagrion oceanicum*—Unit 12—Lowland Wet follows:

Megalagrion oceanicum
Lowland Wet
Unit 9, Unit 10, Unit 11 and Unit 12



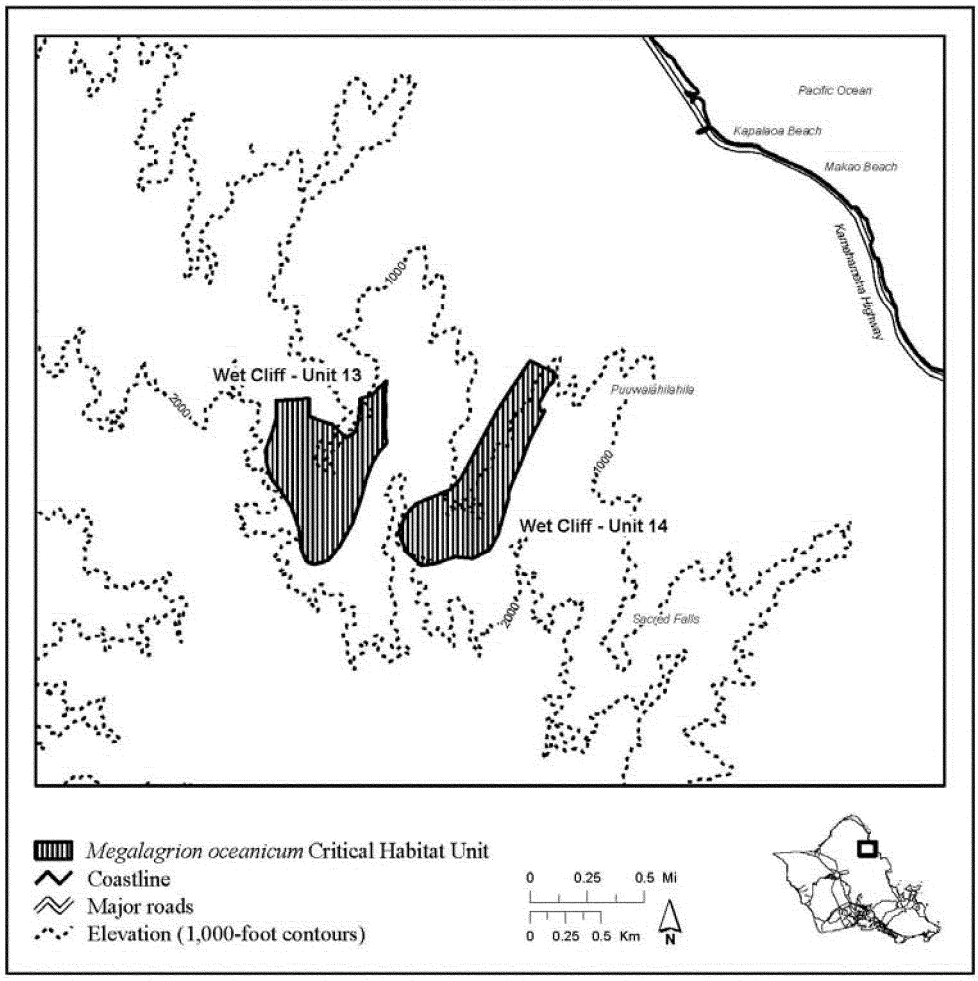
(11) *Megalagrion oceanicum*—Unit 13—Wet Cliff, Honolulu County, Hawaii (151 ac; 61 ha) and *Megalagrion oceanicum*—Unit 14—Wet Cliff, Honolulu County, Hawaii (144 ac; 58 ha).

(i) [Reserved for textual description of Unit 13.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(ii) [Reserved for textual description of Unit 14.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(iii) **Note:** Map of *Megalagrion oceanicum*—Unit 13—Wet Cliff and *Megalagrion oceanicum*—Unit 14—Wet Cliff follows:

Megalagrion oceanicum
Wet Cliff
Unit 13 and Unit 14

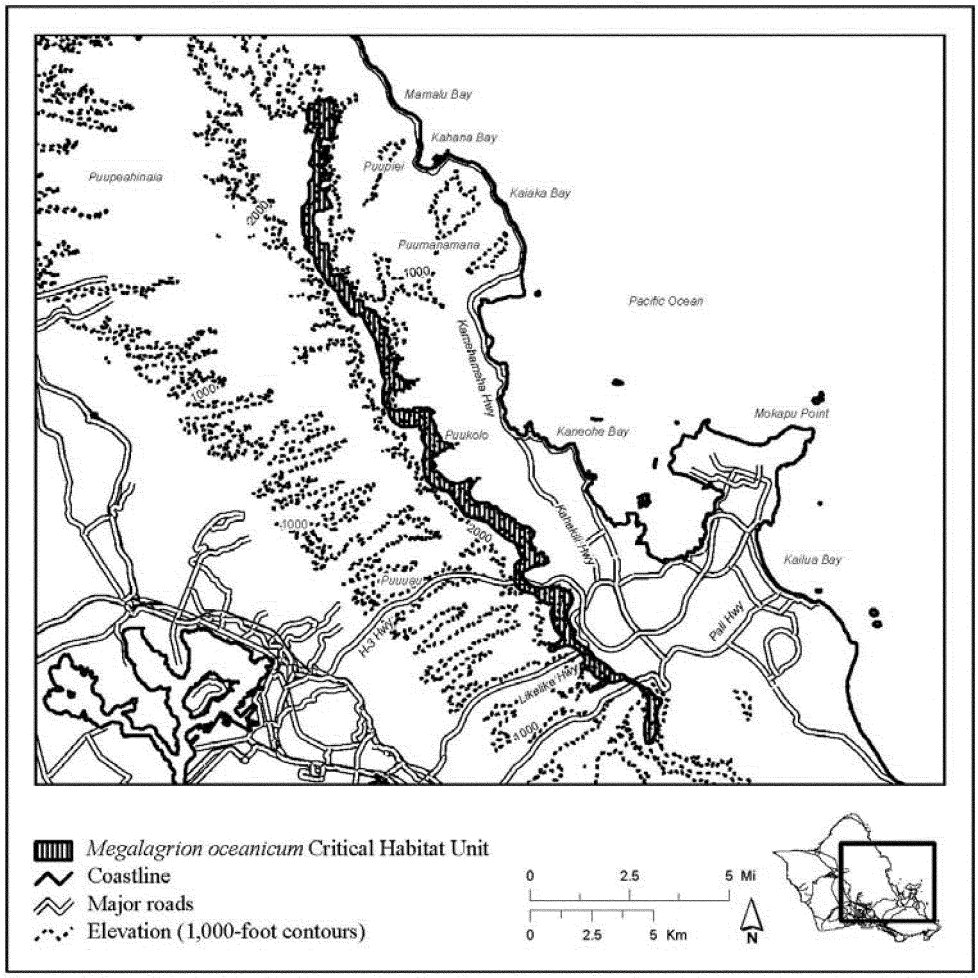


(12) *Megalagrion oceanicum*—Unit 15—Wet Cliff, Honolulu County, Hawaii (4,649 ac; 1,881 ha).

(i) [Reserved for textual description of Unit 15.] This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.*

(ii) **Note:** Map of *Megalagrion oceanicum*—Unit 15—Wet Cliff follows:

Megalagrion oceanicum
Wet Cliff
Unit 15



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* * * * *

5. Amend § 17.99 as follows:

a. 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)(civ), the introductory text	Kauai 10—*Phlegmariurus nutans*—a	Kauai 10—*Huperzia nutans*—a.
(a)(1)(ccxl), the introductory text	Kauai 11—*Mariscus pennatiformis*—a	Kauai 11—*Cyperus pennatiformis*—a.

b. Amend paragraph (a)(1) by removing the maps in paragraphs (a)(1)(civ)(B) and (a)(1)(ccxl)(B), and adding in their place the maps set forth below.

c. In paragraph (a)(1)(cdlix), amend 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 10—*Phlegmariurus nutans*—a	Kauai 10—*Huperzia nutans*—a.
Species unoccupied	*Phlegmariurus nutans*	*Huperzia nutans.*
Unit name	Kauai 11—*Mariscus pennatiformis*—a	Kauai 11—*Cyperus pennatiformis*—a.
Species unoccupied	*Mariscus pennatiformis*	*Cyperus pennatiformis.*

d. 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 Cyperaceae: *Mariscus pennatiformis* (NCN)	Family Cyperaceae: *Cyperus pennatiformis* (NCN).
Kauai 11—*Mariscus pennatiformis*—a	Kauai 11—*Cyperus pennatiformis*—a.
Mariscus pennatiformis	*Cyperus pennatiformis.*

e. 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 Lycopodiaceae: *Phlegmariurus nutans* (wawaeiole)	Family Lycopodiaceae: *Huperzia nutans* (wawaeiole).
Kauai 10—*Phlegmariurus nutans*—a	Kauai 10—*Huperzia nutans*—a.
Phlegmariurus nutans.	*Huperzia nutans.*

f. Amend paragraph (e)(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
(e)(1)(xii), the introductory text	Maui 6—*Mariscus pennatiformis*—a	Maui 6—*Cyperus pennatiformis*—a.
(e)(1)(civ), the introductory text	Maui 17—*Hedyotis coriacea*—a	Maui 17—*Kadua coriacea*—a.
(e)(1)(cv), the introductory text	Maui 17—*Hedyotis coriacea*—b	Maui 17—*Kadua coriacea*—b.

g. Amend paragraph (e)(1) by removing the maps in paragraphs (e)(1)(xii)(B), (e)(1)(civ)(B), and (e)(1)(cv)(B), and adding in their place the maps set forth below.

h. In paragraph (e)(1)(cxxxviii), amend the Table of Protected Species Within Each Critical Habitat Unit for Maui, 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	Maui 6—*Mariscus pennatiformis*—a	Maui 6—*Cyperus pennatiformis*—a.
Species occupied	*Mariscus pennatiformis*	*Cyperus pennatiformis.*
Unit name	Maui 17—*Hedyotis coriacea*—a	Maui 17—*Kadua coriacea*—a.
Species occupied	*Hedyotis coriacea*	*Kadua coriacea.*
Unit name	Maui 17—*Hedyotis coriacea*—b	Maui 17—*Kadua coriacea*—b.
Species unoccupied	*Hedyotis coriacea*	*Kadua coriacea.*

i. Amend paragraph (f)(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 pennatiformis* (NCN)	Family Cyperaceae: *Cyperus pennatiformis* (NCN).
Maui 6—*Mariscus pennatiformis*—a	Maui 6—*Cyperus pennatiformis*—a.
Mariscus pennatiformis	*Cyperus pennatiformis*.
Family Rubiaceae: *Hedyotis coriacea* (kioele)	Family Rubiaceae: *Kadua coriacea* (kioele).
Maui 17—*Hedyotis coriacea*—a	Maui 17—*Kadua coriacea*—a.
Maui 17—*Hedyotis coriacea*—b	Maui 17—*Kadua coriacea*—b.
Hedyotis coriacea	*Kadua coriacea*.

j. Amend paragraph (g) 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
(g)(7), the introductory text	Laysan 1–*Mariscus pennatiformis*–entire island.	Laysan 1–*Cyperus pennatiformis*–entire island.

k. Amend paragraph (g) by removing the map in paragraph (g)(7)(ii), and adding in its place the map set forth below.

l. In paragraph (g)(9), amend the Table of Protected Species Within Each Critical Habitat Unit for the Northwestern Hawaiian Islands, 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
Species—Occupied	*Mariscus pennatiformis*	*Cyperus pennatiformis*.

m. Amend paragraph (h) 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 pennatiformis* (NCN)	Family Cyperaceae: *Cyperus pennatiformis* (NCN).
Laysan 1–*Mariscus pennatiformis*	Laysan 1–*Cyperus pennatiformis*.
Mariscus pennatiformis	*Cyperus pennatiformis*.

n. Revise paragraphs (i) and (j) to read as set forth below.

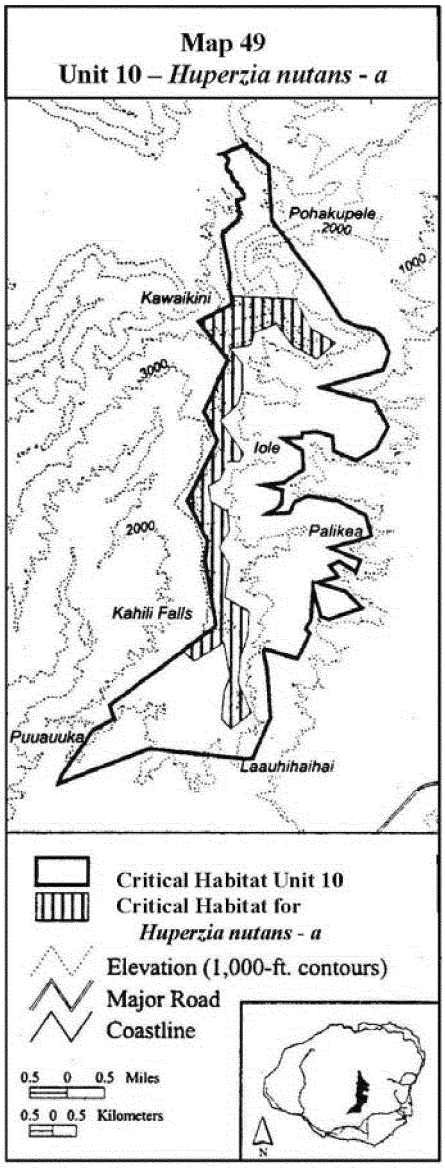
§ 17.99 Critical habitat; plants on the islands of Kauai, Niihau, Molokai, Maui, Kahoolawe, Oahu, and Hawaii, HI, and on the Northwestern Hawaiian Islands.

(a) * * *

(1) * * *

(civ) * * *

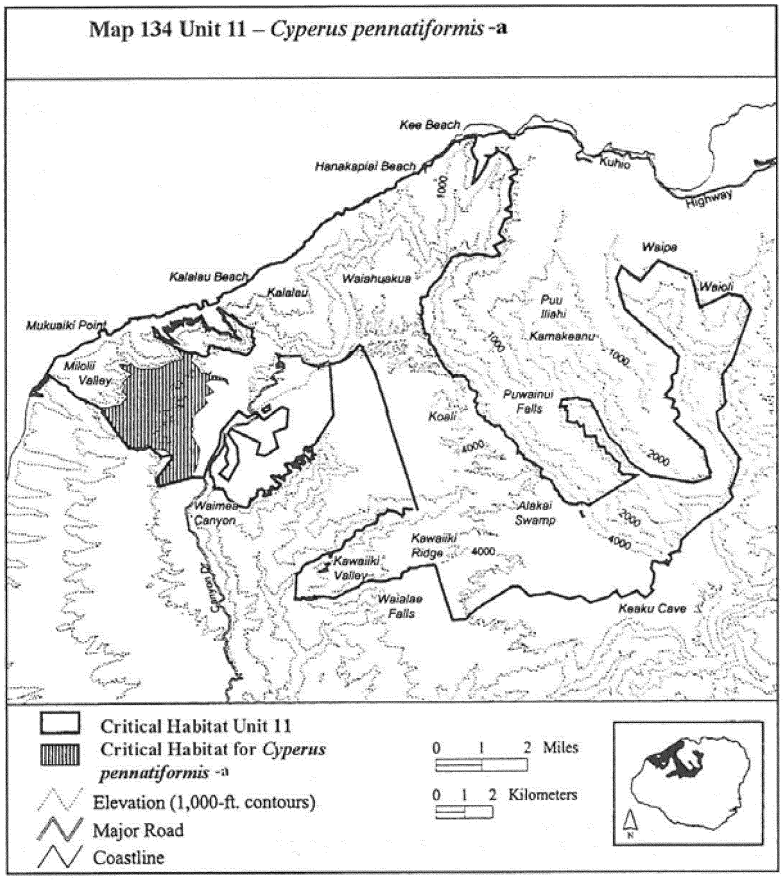
(B) **Note:** Map 49 follows:



* * * * *

(ccxl) * * *

(B) **Note:** Map 134 follows:



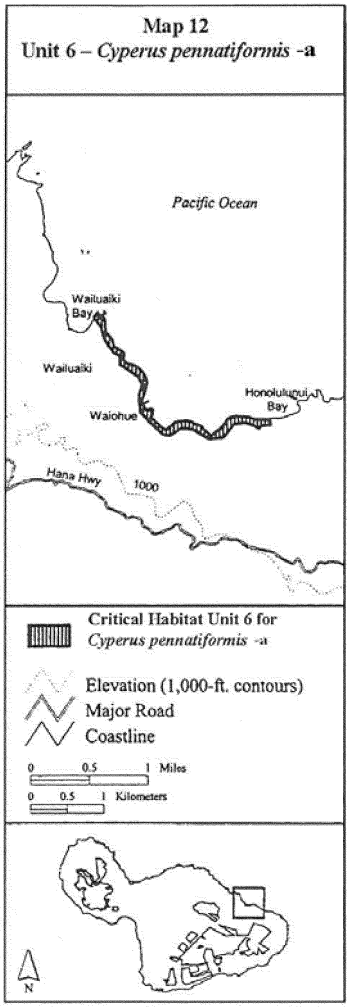
* * * * *

(e) * * *

(1) * * *

(xii) * * *

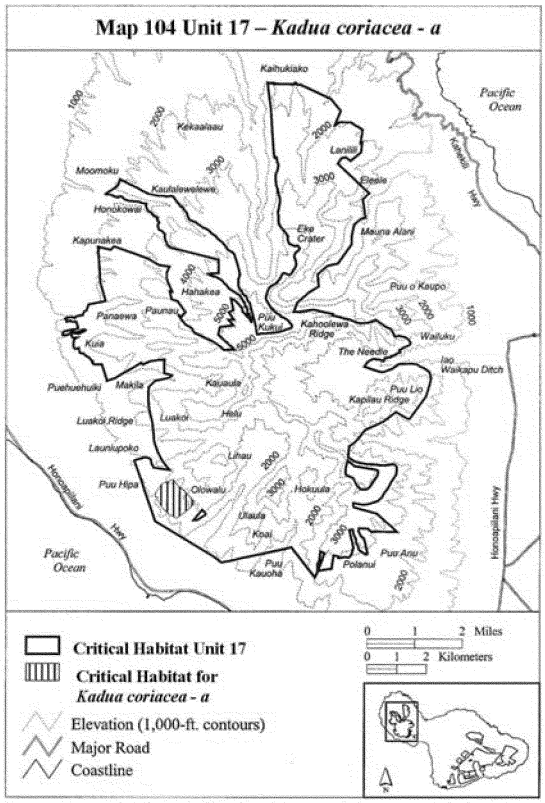
(B) **Note:** Map 12 follows:



* * * * *

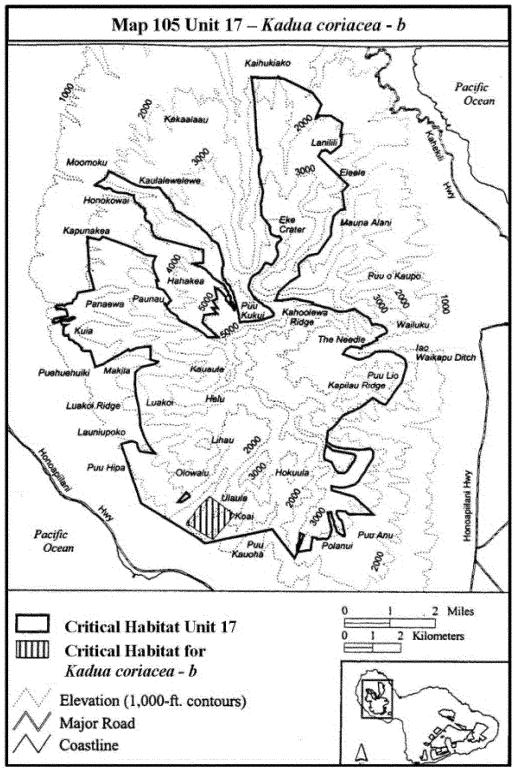
(civ) * * *

(B) **Note:** Map 104 follows:



(cv) * * *

(B) **Note:** Map 105 follows:

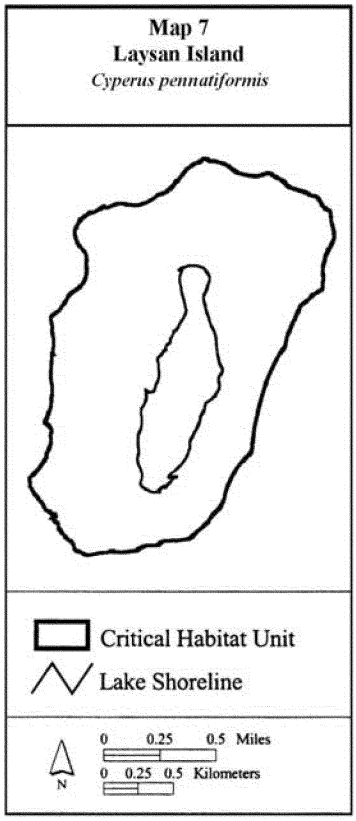


* * * * *

(g) * * *

(7) * * *

(ii) **Note:** Map 7 follows:



* * * * *

(i) *Oahu.* 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 Oahu. 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:

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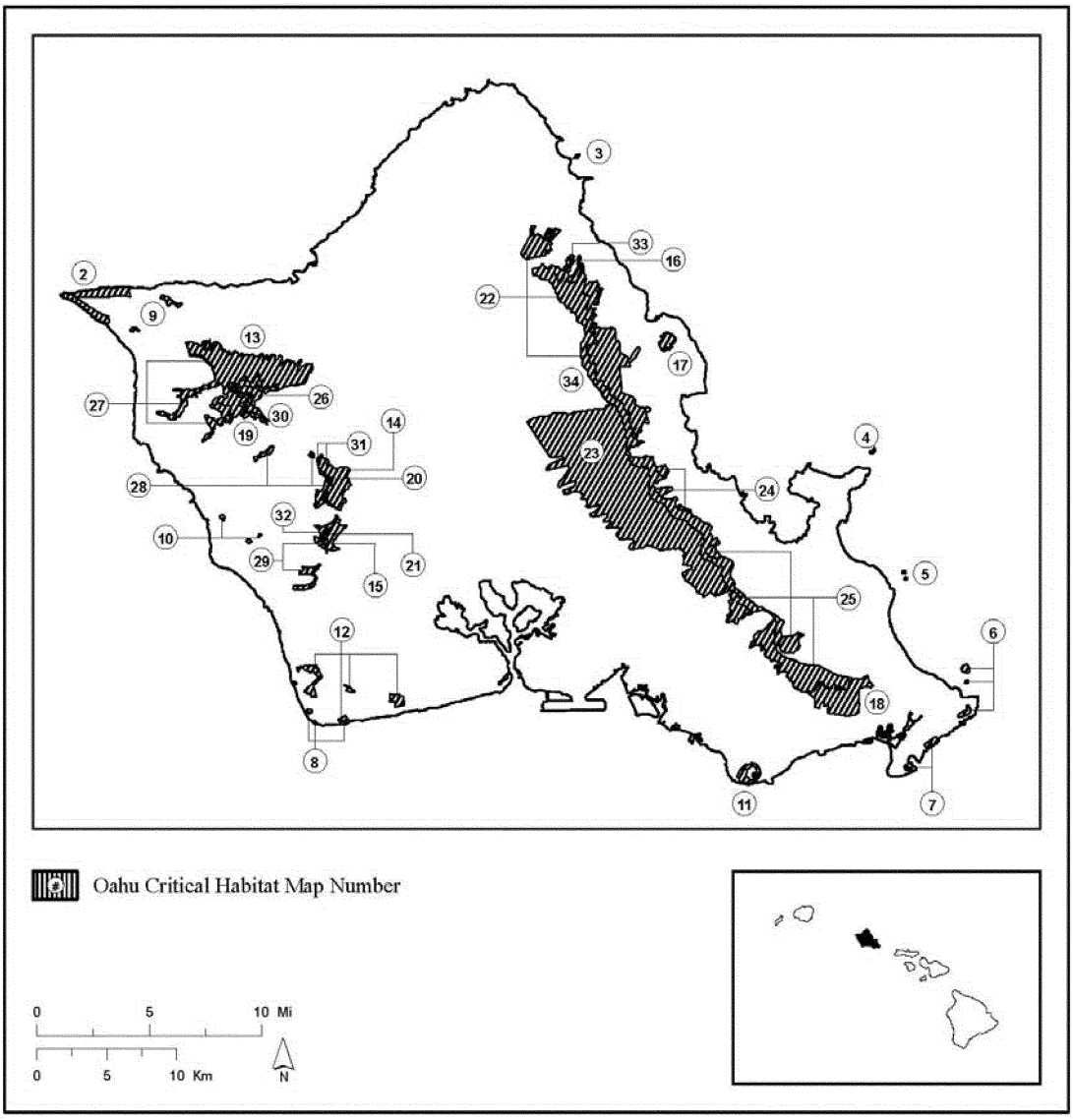
Map 1
Oahu Critical Habitat–Island Index Map



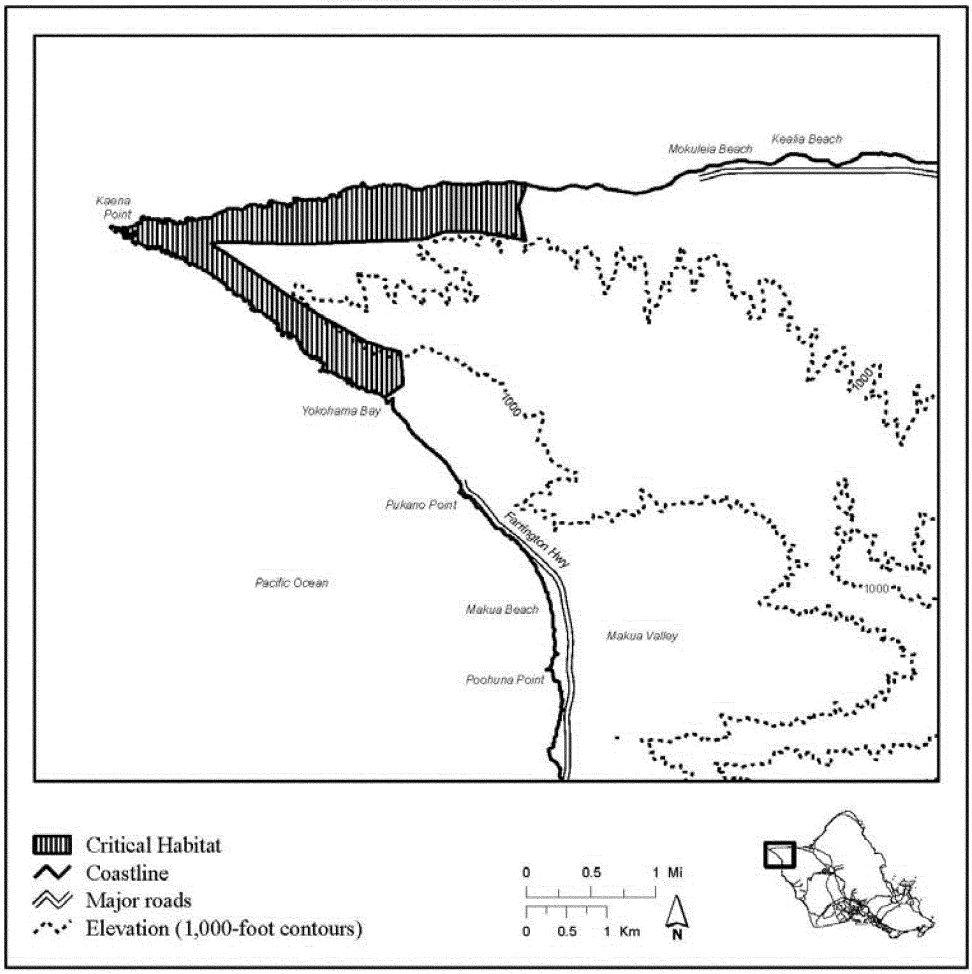
(2) Oahu—Coastal—Unit 1 (958 ac; 388 ha)

(i) [Reserved for textual description of unit.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Schiedea kealiae, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(ii) **Note:**

Map of Oahu—Coastal—Unit 1 (Map 2) follows:

Map 2
Oahu–Coastal
Unit 1

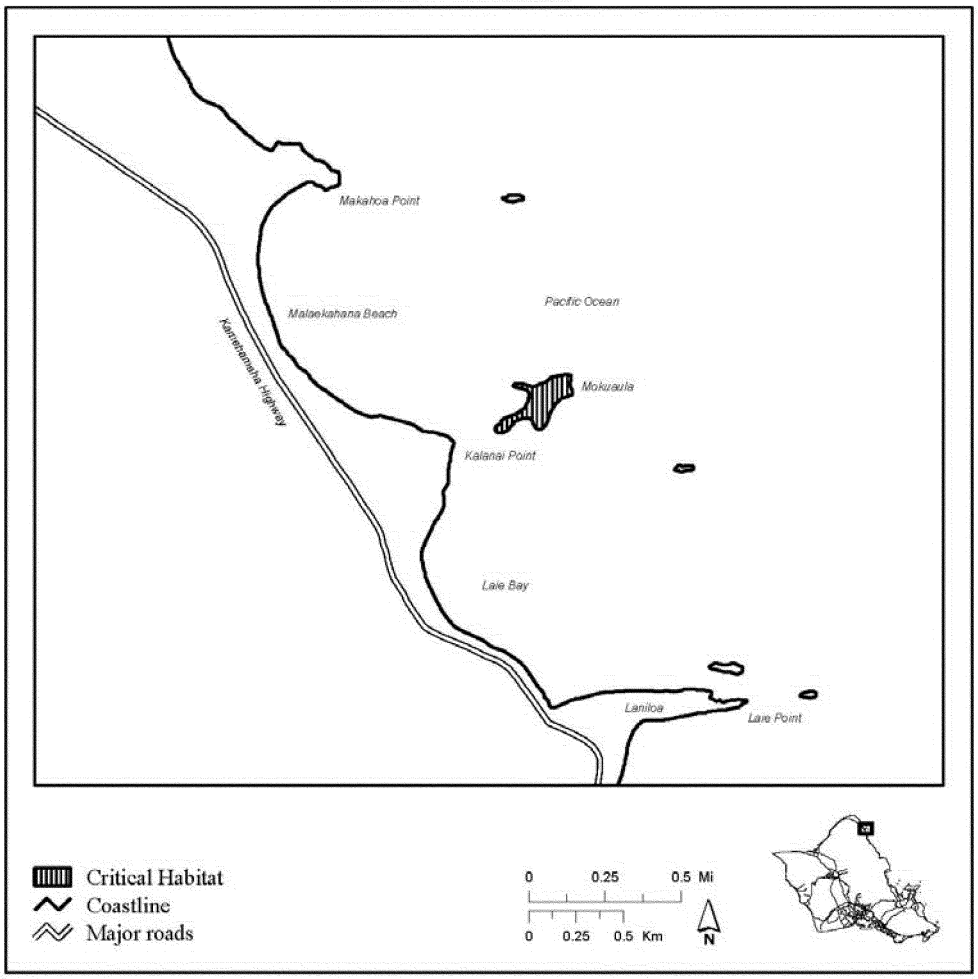


(3) Oahu—Coastal—Unit 2 (12 ac; 5 ha)

(i) [Reserved for textual description of unit.] This unit is critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(ii) **Note:** Map of Oahu—Coastal—Unit 2 (Map 3) follows:

Map 3
Oahu–Coastal
Unit 2



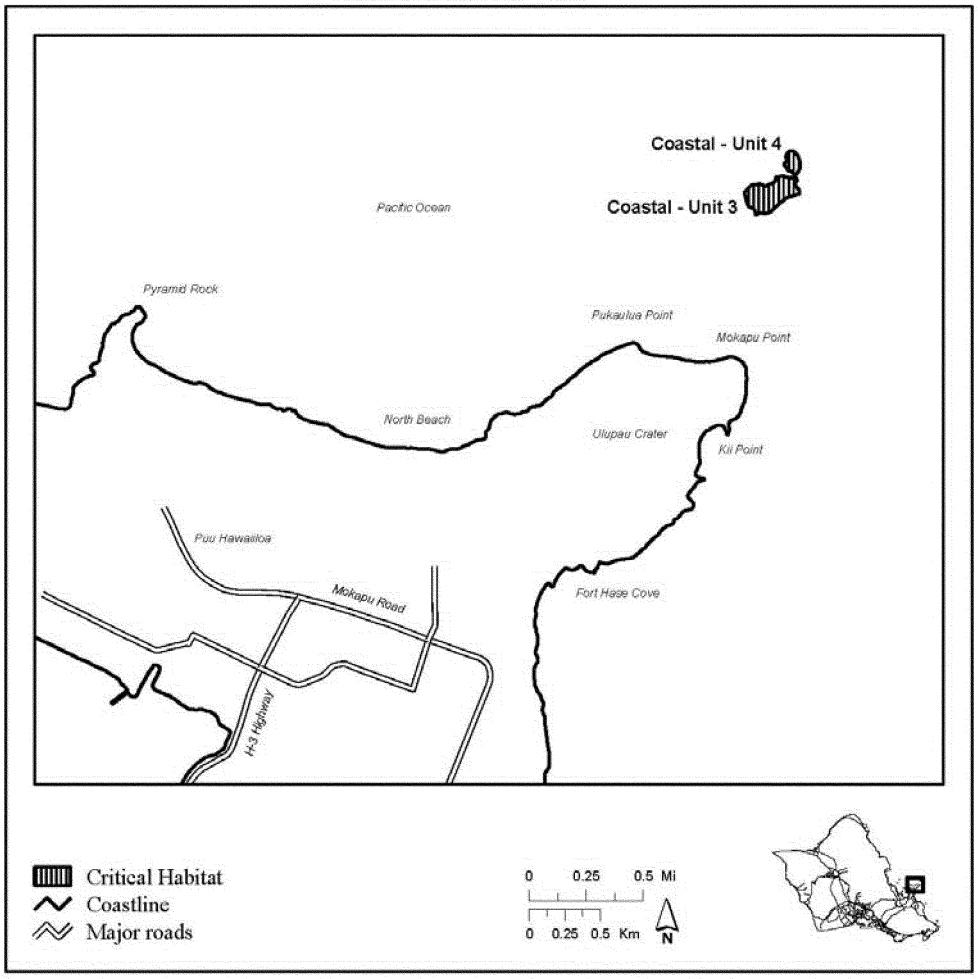
(4) Oahu—Coastal—Unit 3 (15 ac; 6 ha) and Oahu—Coastal—Unit 4 (3 ac; 1 ha)

(i) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(ii) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(iii) **Note:** Map of Oahu—Coastal—Unit 3 and Oahu—Coastal—Unit 4 (Map 4) follows:

Map 4
Oahu–Coastal
Unit 3 and Unit 4



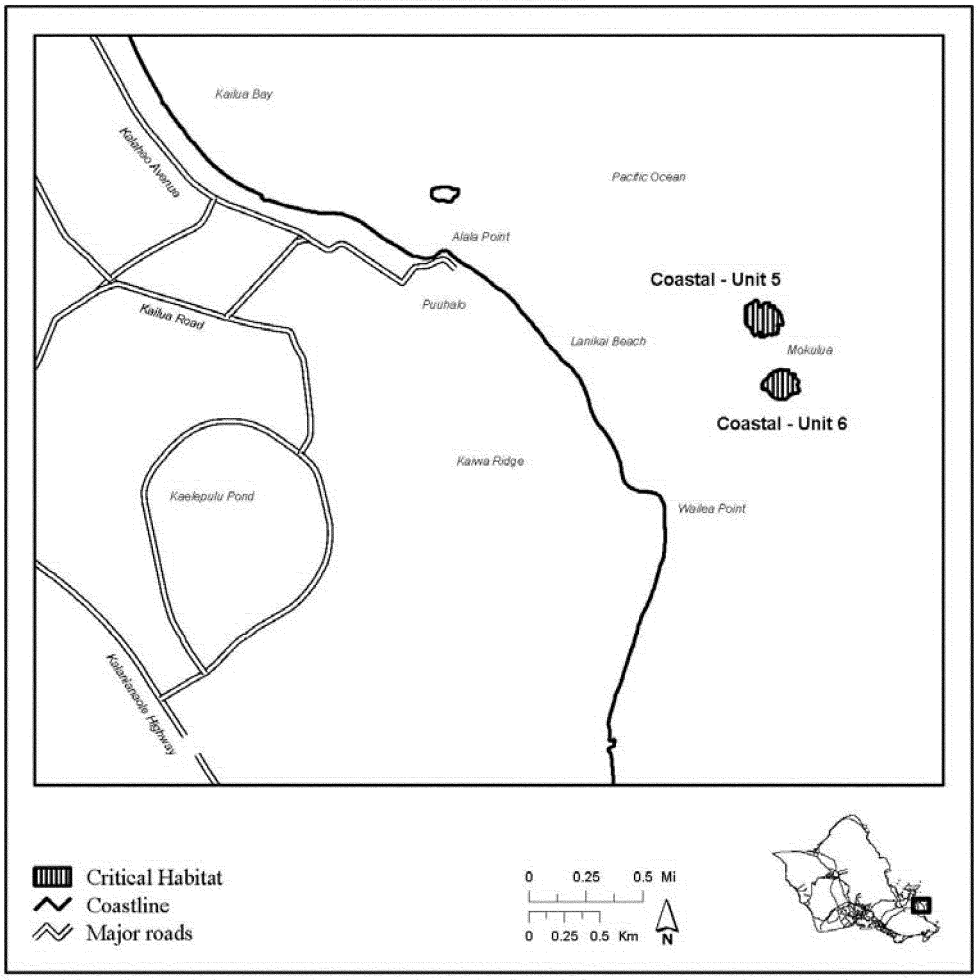
(5) Oahu—Coastal—Unit 5 (12 ac; 5 ha) and Oahu—Coastal—Unit 6 (9 ac; 4 ha)

(i) [Reserved for textual description of Unit 5.] This unit is critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(ii) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(iii) **Note:** Map of Oahu—Coastal—Unit 5 and Oahu—Coastal—Unit 6 (Map 5) follows:

Map 5
Oahu–Coastal
Unit 5 and Unit 6



(6) Oahu—Coastal—Unit 7 (67 ac; 27 ha), Oahu—Coastal—Unit 8 (10 ac; 4 ha), and Oahu–Coastal–Unit 9 (84 ac; 34 ha)

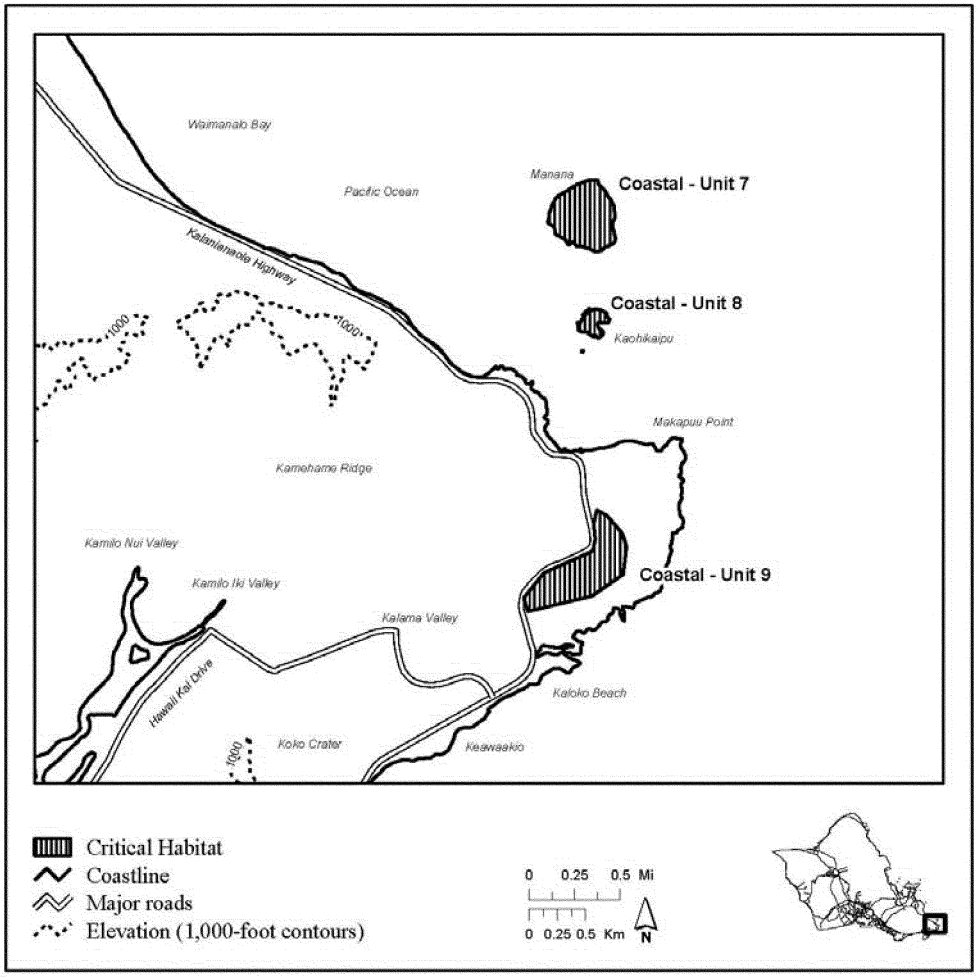
(i) [Reserved for textual description of Unit 7.] This unit is critical habitat for, *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(ii) [Reserved for textual description of Unit 8.] This unit is critical habitat for, *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(iii) [Reserved for textual description of Unit 9.] This unit is critical habitat for, *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(iv) **Note:** Map of Oahu—Coastal—Unit 7, Oahu—Coastal—Unit 8, and Oahu—Coastal—Unit 9 (Map 6) follows:

Map 6
Oahu–Coastal
Unit 7, Unit 8 and Unit 9



(7) Oahu—Coastal—Unit 10 (74 ac; 30 ha), Oahu—Coastal—Unit 11 (20 ac; 8 ha), and Oahu—Coastal—Unit 12 (11 ac; 5 ha)

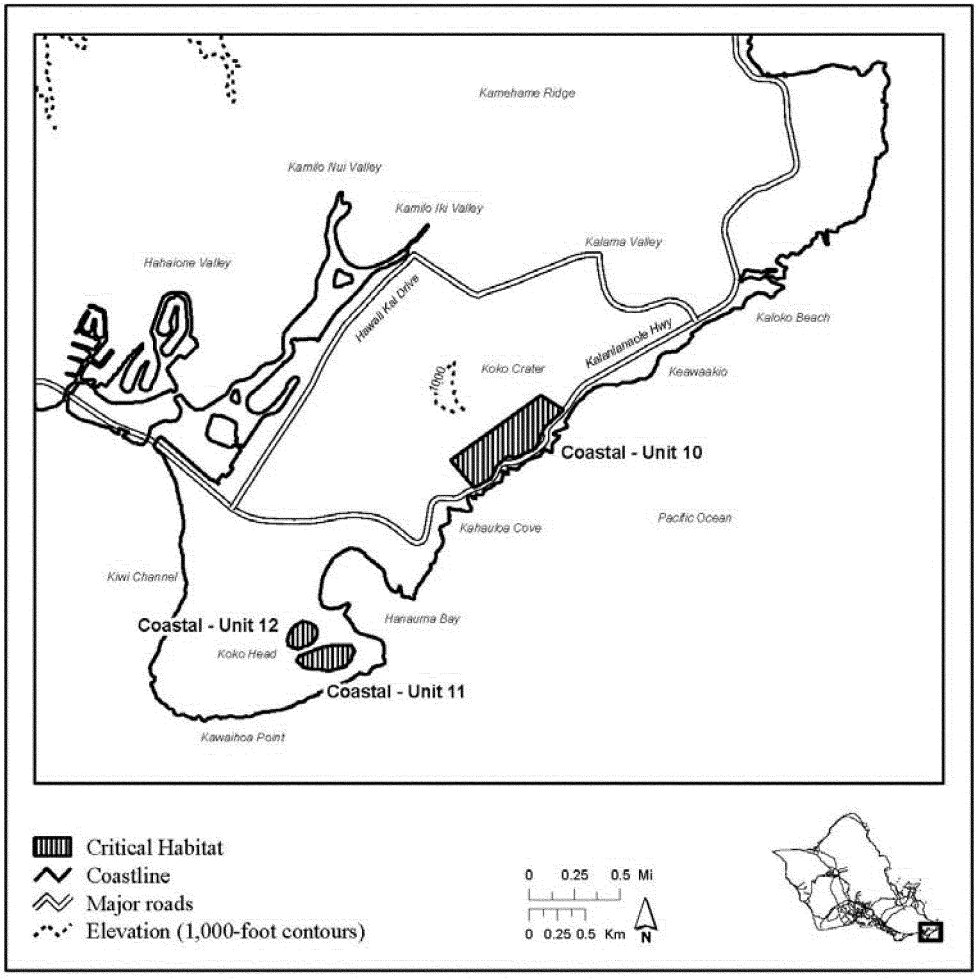
(i) [Reserved for textual description of Unit 10.] This unit is critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(ii) [Reserved for textual description of Unit 11.] This unit is critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Cyperus trachysanthos, Marsilea villosa, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(iii) [Reserved for textual description of Unit 12.] This unit is critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Cyperus trachysanthos, Marsilea villosa, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(iv) **Note:** Map of Oahu—Coastal—Unit 10, Oahu—Coastal—Unit 11, and Oahu—Coastal—Unit 12 (Map 7) follows:

Map 7
Oahu–Coastal
Unit 10, Unit 11 and Unit 12



(8) Oahu—Coastal—Unit 13 (24 ac; 10 ha), Oahu—Coastal—Unit 14 (4 ac; 2 ha), and Oahu—Coastal—Unit 15 (34 ac; 14 ha)

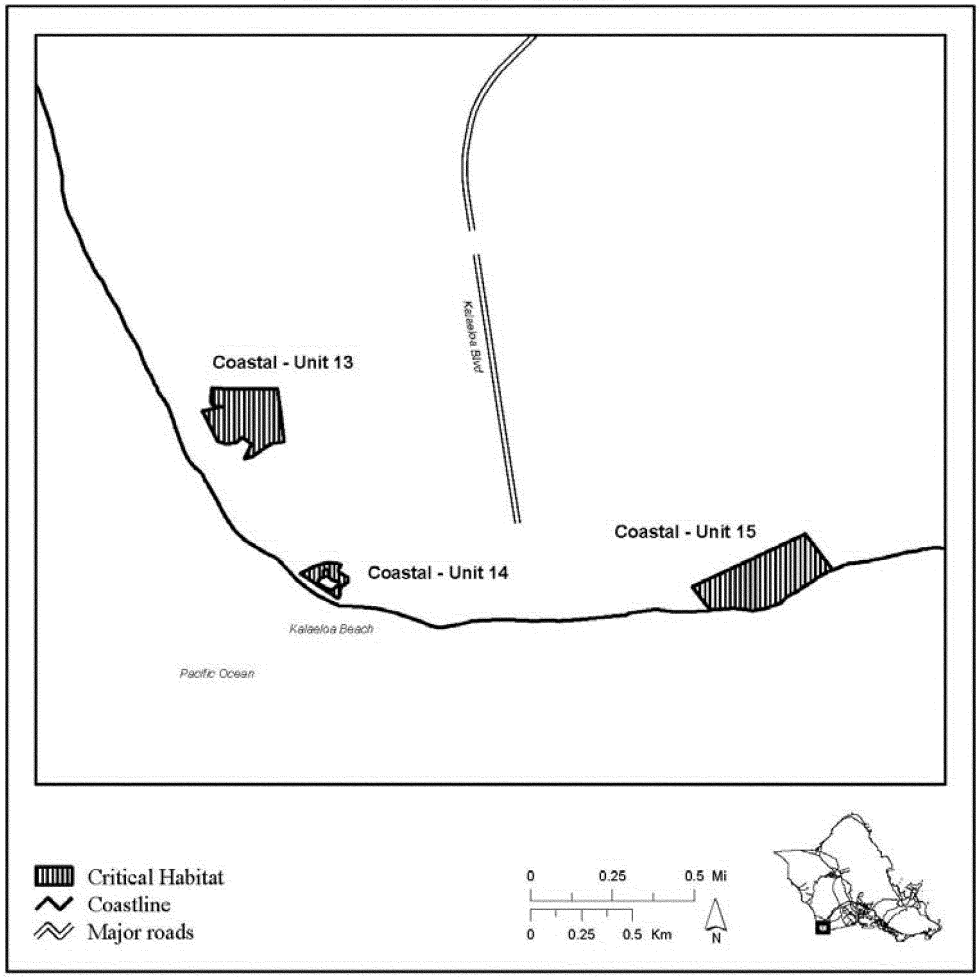
(i) [Reserved for textual description of Unit 13.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Schiedea kealiae, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(ii) [Reserved for textual description of Unit 14.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Schiedea kealiae, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(iii) [Reserved for textual description of Unit 15.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Schiedea kealiae, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(iv) **Note:** Map of Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, and Oahu—Coastal—Unit 15 (Map 8) follows:

Map 8
Oahu–Coastal
Unit 13, Unit 14 and Unit 15



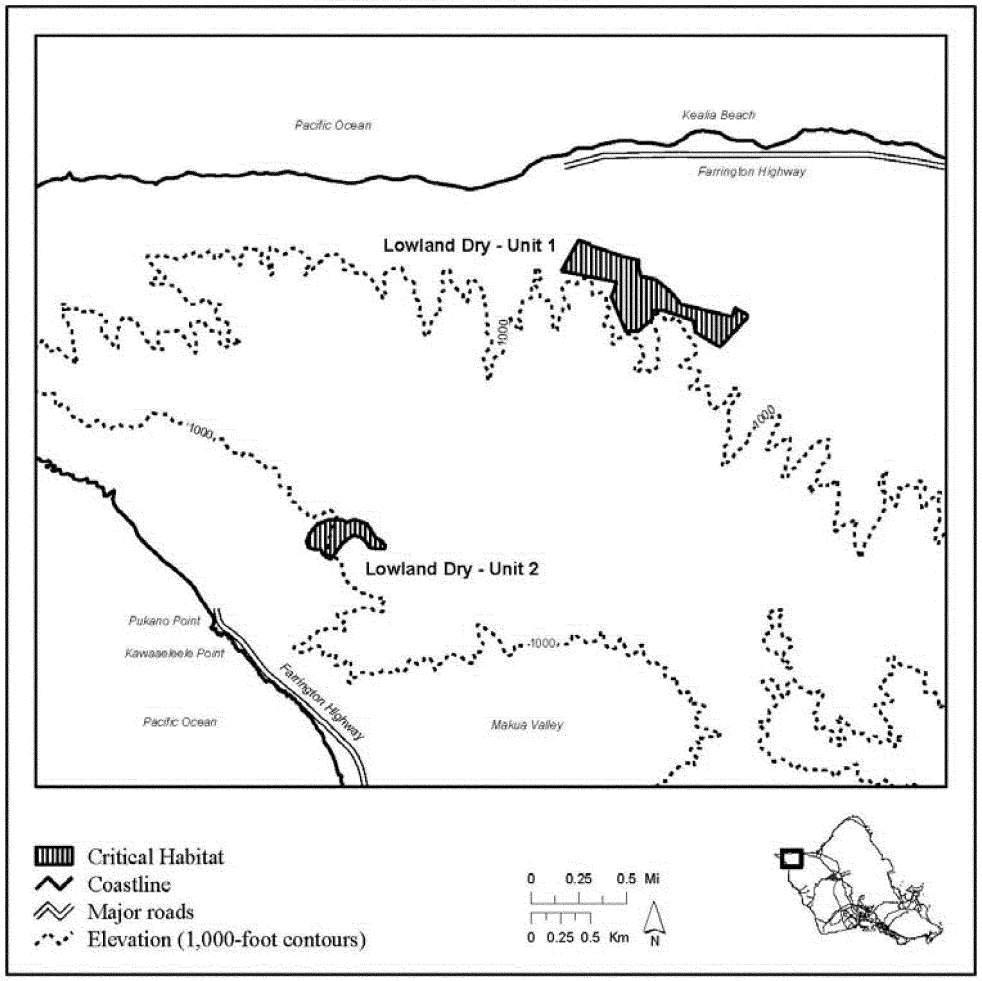
(9) Oahu—Lowland Dry—Unit 1 (102 ac; 41 ha) and Oahu—Lowland Dry—Unit 2 (29 ac; 12)

(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Euphorbia haeleeleana, Gouania meyenii, Gouania vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, Schiedea kealiae,* and *Spermolepis hawaiiensis.*

(ii) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Euphorbia haeleeleana, Gouania meyenii, Gouania vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, Schiedea kealiae,* and *Spermolepis hawaiiensis.*

(iii) **Note:** Map of Oahu—Lowland Dry—Unit 1 and Oahu—Lowland Dry—Unit 2 (Map 9) follows:

Map 9
Oahu–Lowland Dry
Unit 1 and Unit 2



(10) Oahu—Lowland Dry—Unit 3 (25 ac; 10 ha), Oahu—Lowland Dry—Unit 4 (18 ac; 7 ha), and Oahu—Lowland Dry—Unit 5 (8 ac; 3 ha)

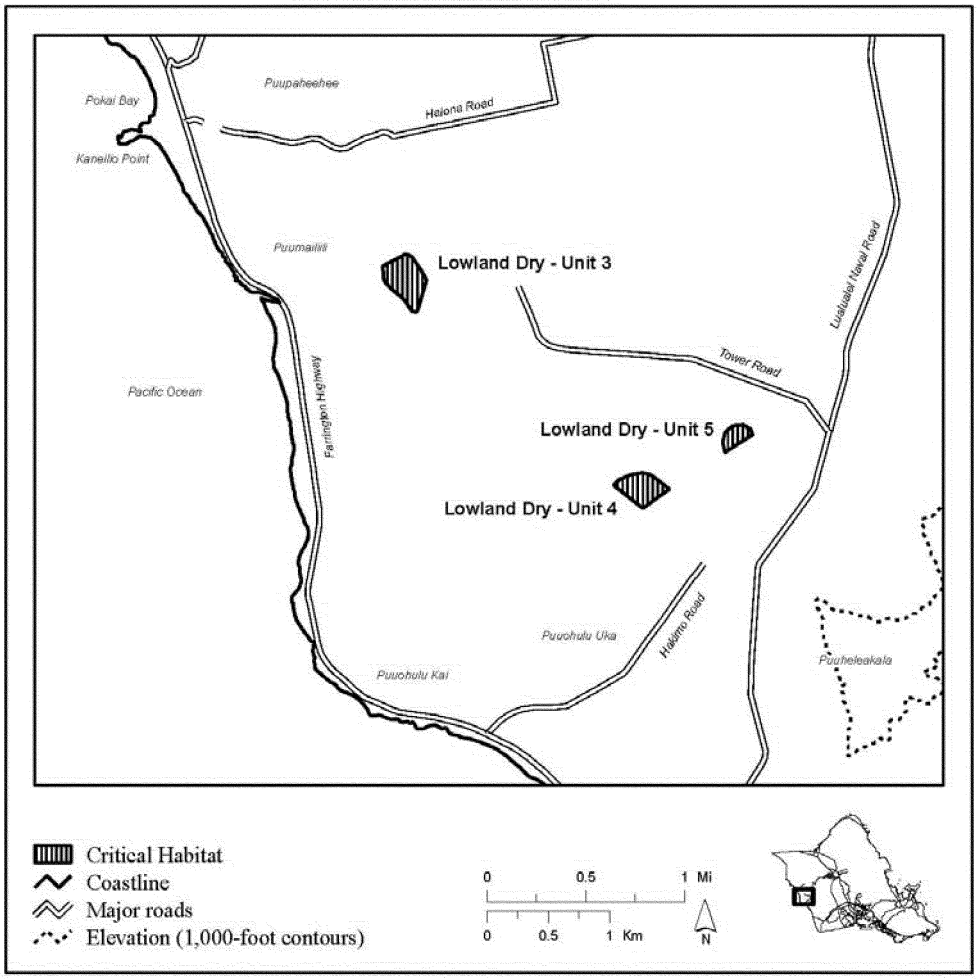
(i) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Cyperus trachysanthos, Euphorbia haeleeleana, Gouania meyenii, Gouania vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Marsilea villosa, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, Schiedea kealiae,* and *Spermolepis hawaiiensis.*

(ii) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Cyperus trachysanthos, Euphorbia haeleeleana, Gouania meyenii, Gouania vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Marsilea villosa, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, Schiedea kealiae,* and *Spermolepis hawaiiensis.*

(iii) [Reserved for textual description of Unit 5.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Cyperus trachysanthos, Euphorbia haeleeleana, Gouania meyenii, Gouania vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Marsilea villosa, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, Schiedea kealiae,* and *Spermolepis hawaiiensis.*

(iv) **Note:** Map of Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, and Oahu—Lowland Dry—Unit 5 (Map 10) follows:

Map 10
Oahu–Lowland Dry
Unit 3, Unit 4 and Unit 5



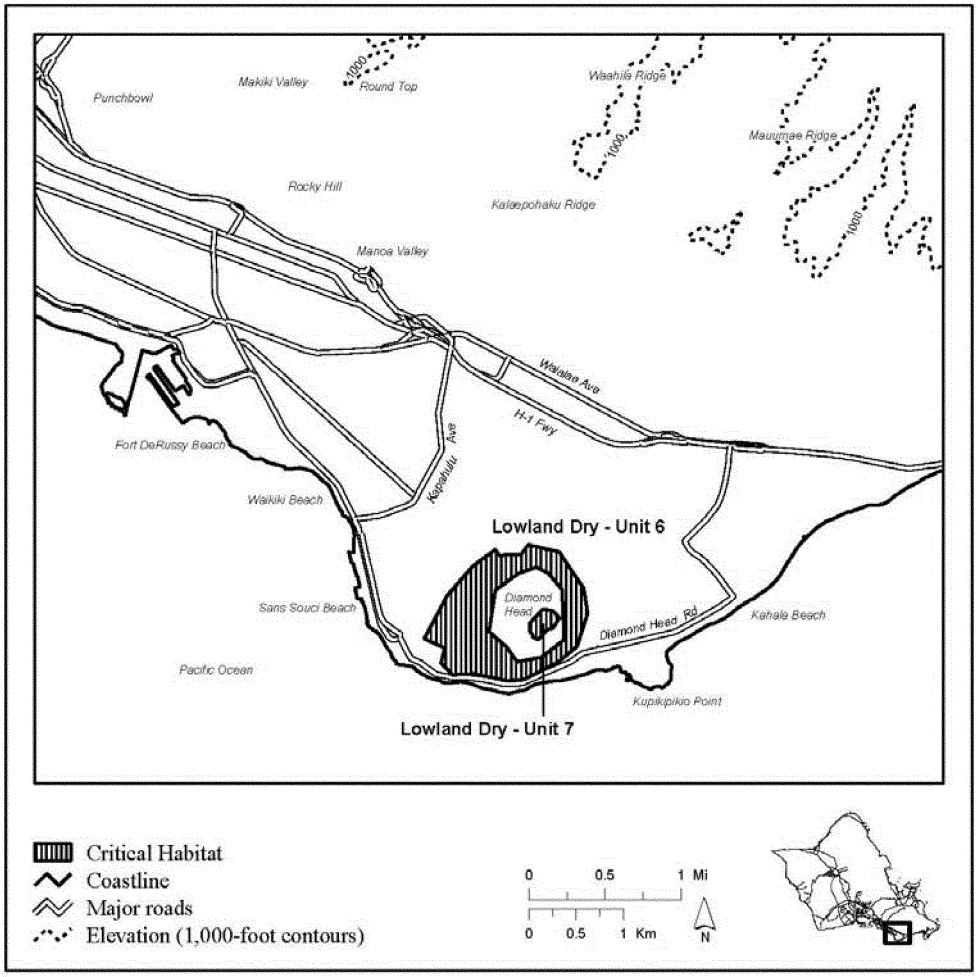
(11) Oahu—Lowland Dry—Unit 6 (287 ac; 116 ha) and Oahu—Lowland Dry—Unit 7 (15 ac; 6 ha)

(i) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Doryopteris takeuchii, Gouania meyenii,* and *Spermolepis hawaiiensis.*

(ii) [Reserved for textual description of Unit 7.] This unit is critical habitat for *Cyperus trachysanthos, Doryopteris takeuchii, Gouania meyenii, Marsilea villosa,* and *Spermolepis hawaiiensis.*

(iii) **Note:** Map of Oahu—Lowland Dry—Unit 6 and Oahu—Lowland Dry—Unit 7 (Map 11) follows:

Map 11
Oahu–Lowland Dry
Unit 6 and Unit 7



(12) Oahu—Lowland Dry—Unit 8 (292 ac; 118 ha), Oahu—Lowland Dry—Unit 9 (40 ac; 16 ha), Oahu—Lowland Dry—Unit 10 (43 ac; 17 ha), and Oahu—Lowland Dry—Unit 11 (166 ac; 67 ha)

(i) [Reserved for textual description of Unit 8.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Chamaesyce skottsbergii* var. *skottsbergii, Euphorbia haeleeleana, Gouania meyenii, Gouania vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, Schiedea kealiae,* and *Spermolepis hawaiiensis.*

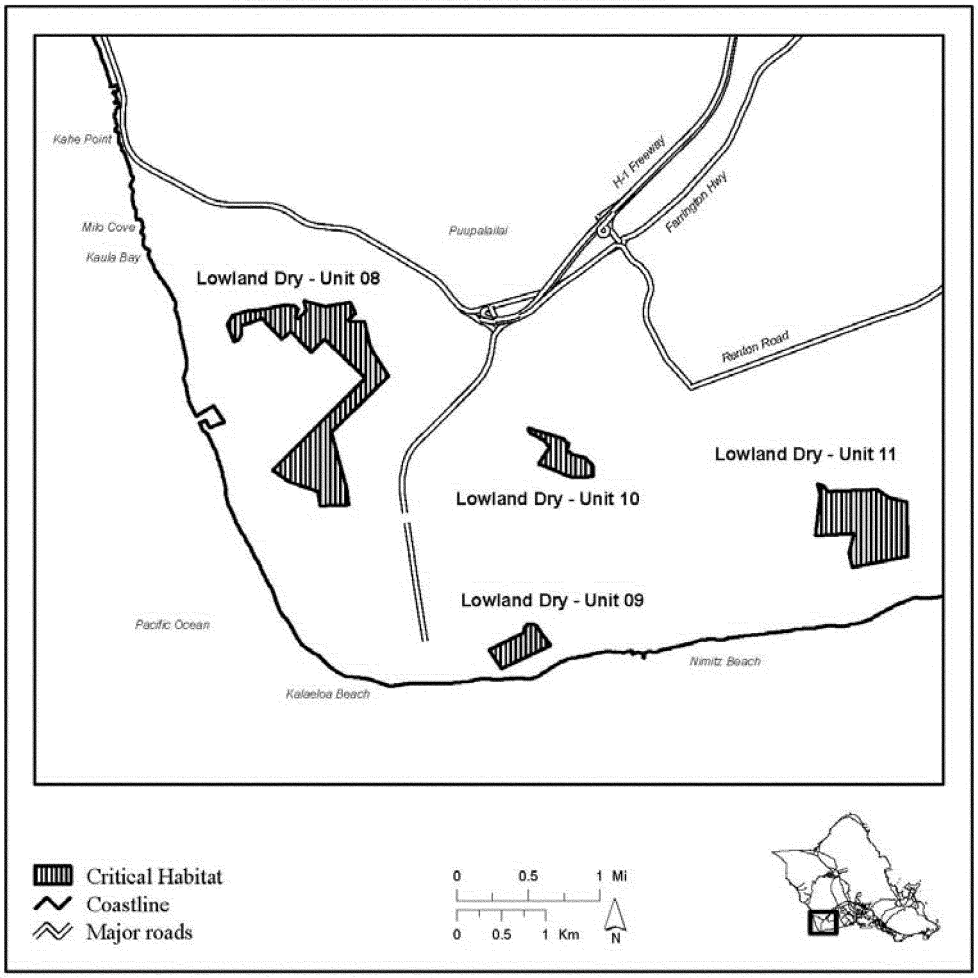
(ii) [Reserved for textual description of Unit 9.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Chamaesyce skottsbergii* var. *skottsbergii, Euphorbia haeleeleana, Gouania meyenii, Gouania vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, Schiedea kealiae,* and *Spermolepis hawaiiensis.*

(iii) [Reserved for textual description of Unit 10.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Chamaesyce skottsbergii* var. *skottsbergii, Euphorbia haeleeleana, Gouania meyenii, Gouania vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, Schiedea kealiae,* and *Spermolepis hawaiiensis.*

(iv) [Reserved for textual description of Unit 11.] This unit is critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Chamaesyce skottsbergii* var. *skottsbergii, Euphorbia haeleeleana, Gouania meyenii, Gouania vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Pleomele forbesii, Schiedea hookeri, Schiedea kealiae,* and *Spermolepis hawaiiensis.*

(v) **Note:** Map of Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11 (Map 12) follows:

Map 12
Oahu–Lowland Dry
Unit 8, Unit, 9, Unit 10 and Unit 11

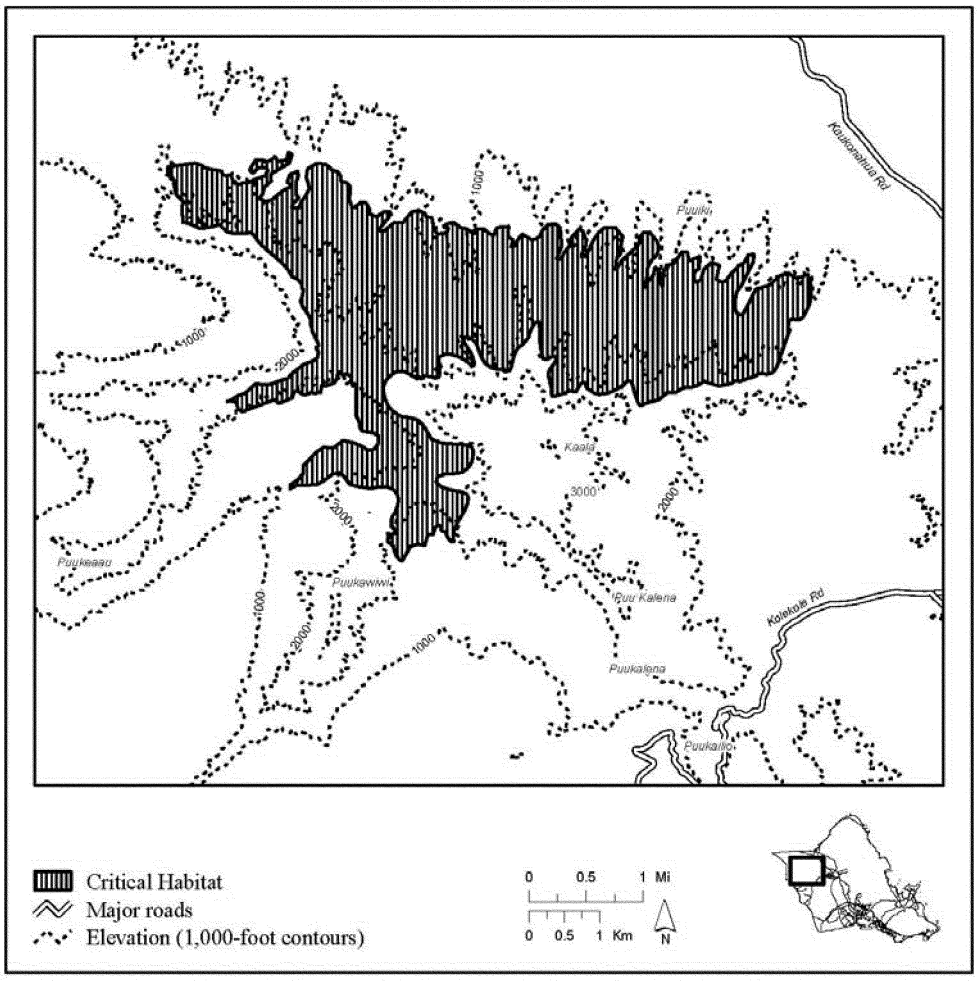


(13) Oahu—Lowland Mesic—Unit 1 (4,450 ac; 1,801 ha)

(i) [Reserved for textual description of unit.] This unit is critical habitat for *Abutilon sandwicense, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce celastroides* var. *kaenana, Chamaesyce herbstii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea acuminata, Cyanea calycina, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyanea longiflora, Cyanea pinnatifida, Cyanea superba, Cyperus pennatiformis, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Diellia unisora, Diplazium molokaiense, Dubautia herbstobatae, Eragrostis fosbergii, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gardenia mannii, Gouania meyenii, Gouania vitifolia, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, Isodendrion longifolium, Kadua coriacea, Kadua degeneri, Kadua parvula, Labordia cyrtandrae, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Melicope pallida, Melicope saint-johnii, Neraudia angulata, Nototrichium humile, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia mollis, Phyllostegia parviflora* var. *lydgatei, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, Schiedea kaalae, Schiedea nuttallii, Schiedea obovata, Silene perlmanii, Solanum sandwicense, Stenogyne kanehoana, Tetramolopium lepidotum* ssp. *lepidotum, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana.*

(ii) **Note:** Map of Oahu—Lowland Mesic—Unit 1 (Map 13) follows:

Map 13
Oahu–Lowland Mesic
Unit 1

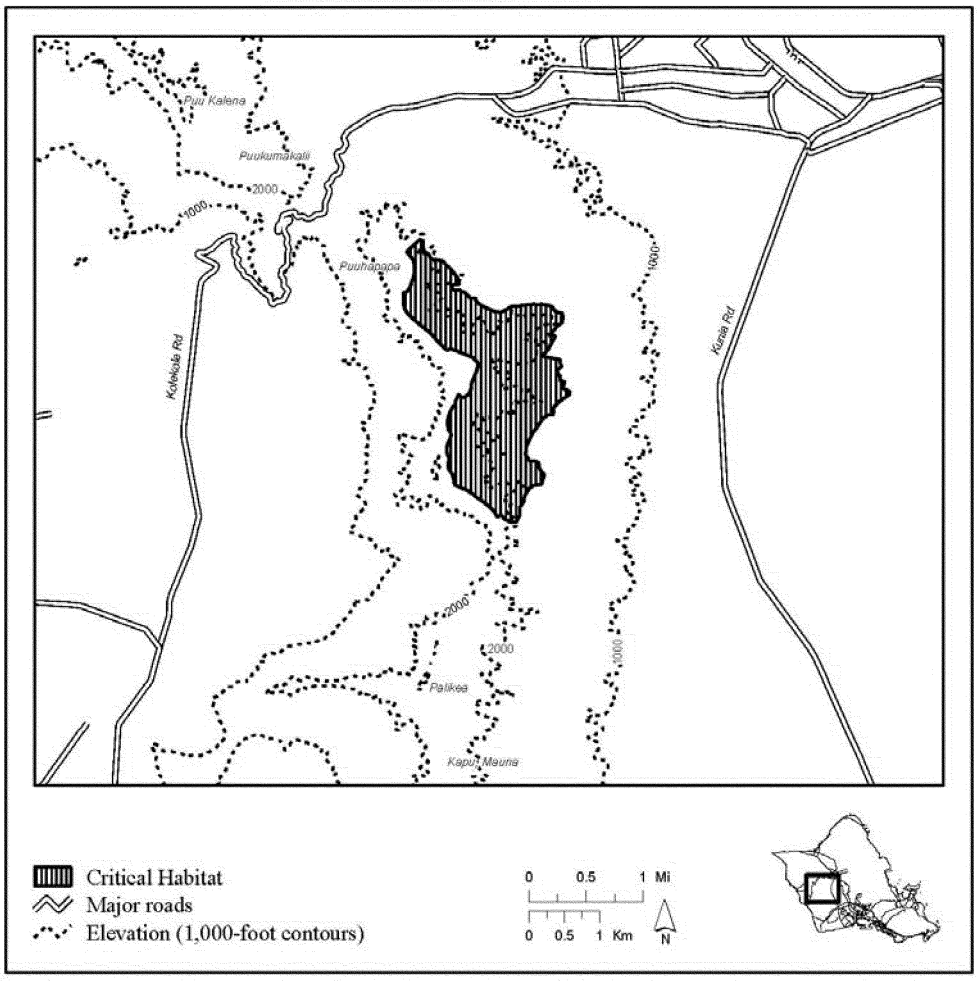


(14) Oahu—Lowland Mesic—Unit 2 (1,063 ac; 430 ha)

(i) [Reserved for textual description of unit.] This unit is critical habitat for *Abutilon sandwicense, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides Chamaesyce celastroides* var. *kaenana, Chamaesyce herbstii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea acuminata, Cyanea calycina, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyanea longiflora, Cyanea pinnatifida, Cyanea superba, Cyperus pennatiformis, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Diellia unisora, Diplazium molokaiense, Dubautia herbstobatae, Eragrostis fosbergii, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gardenia mannii, Gouania meyenii, Gouania vitifolia, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, Isodendrion longifolium, Kadua coriacea, Kadua degeneri, Kadua. parvula, Labordia cyrtandrae, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Melicope pallida, Melicope saint-johnii, Neraudia angulata, Nototrichium humile, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia mollis, Phyllostegia parviflora* var. *lydgatei, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, Schiedea kaalae, Schiedea nuttallii, Schiedea obovata, Silene perlmanii, Solanum sandwicense, Stenogyne kanehoana, Tetramolopium lepidotum* ssp. *lepidotum, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana.*

(ii) **Note:** Map of Oahu—Lowland Mesic—Unit 2 (Map 14) follows:

Map 14
Oahu–Lowland Mesic
Unit 2

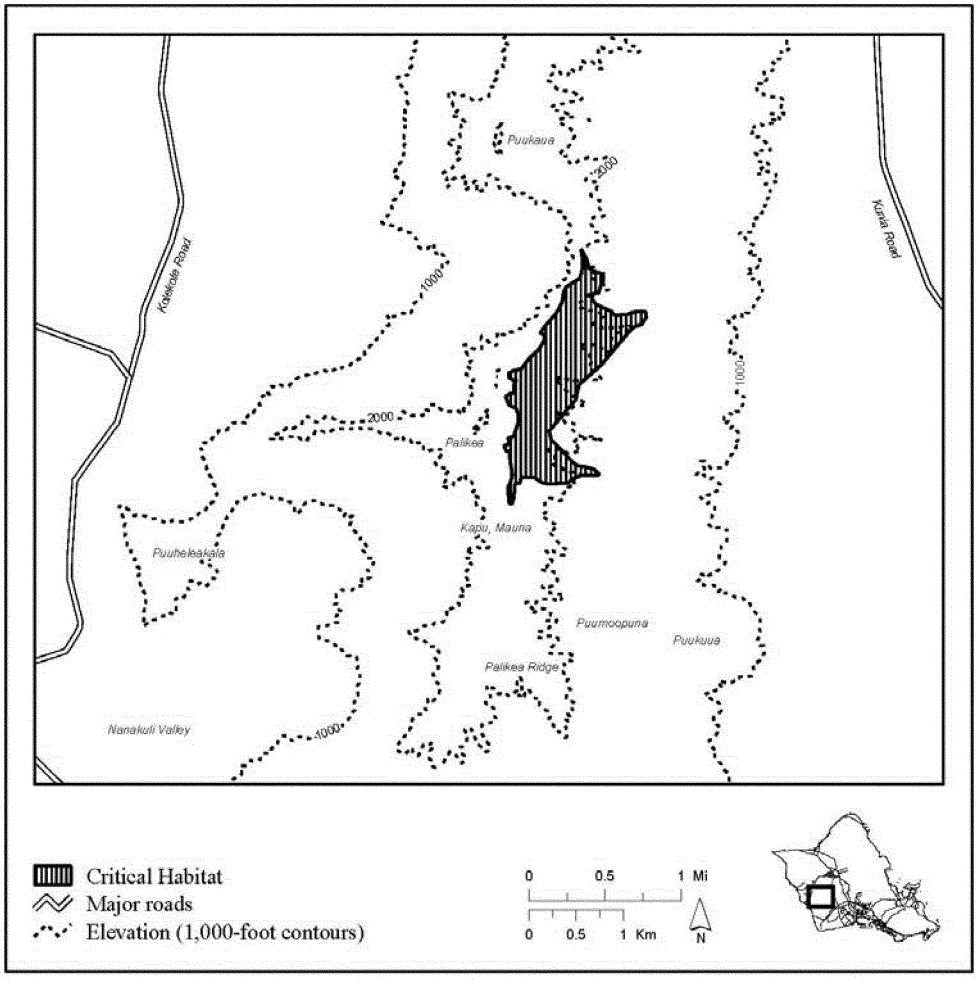


(15) Oahu—Lowland Mesic—Unit 3 (353 ac; 143 ha)

(i) [Reserved for textual description of unit.] This unit is critical habitat for *Abutilon sandwicense, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce celastroides* var. *kaenana, Chamaesyce herbstii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea acuminata, Cyanea calycina, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyanea longiflora, Cyanea pinnatifida, Cyanea superba, Cyperus pennatiformis, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Diellia unisora, Diplazium molokaiense, Dubautia herbstobatae, Eragrostis fosbergii, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gardenia mannii, Gouania meyenii, Gouania vitifolia, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion longifolium, Kadua coriacea, Kadua degeneri, Kadua parvula, Labordia cyrtandrae, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Melicope pallida, Melicope saint-johnii, Neraudia angulata, Nototrichium humile, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegiamollis, Phyllostegia parviflora* var. *lydgatei, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, Schiedea kaalae, Schiedea nuttallii, Schiedea obovata, Silene perlmanii, Solanum sandwicense, Stenogyne kanehoana, Tetramolopium lepidotum* ssp. *lepidotum, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana.*

(ii) **Note:** Map of Oahu—Lowland Mesic—Unit 3 (Map 15) follows:

Map 15
Oahu–Lowland Mesic
Unit 3



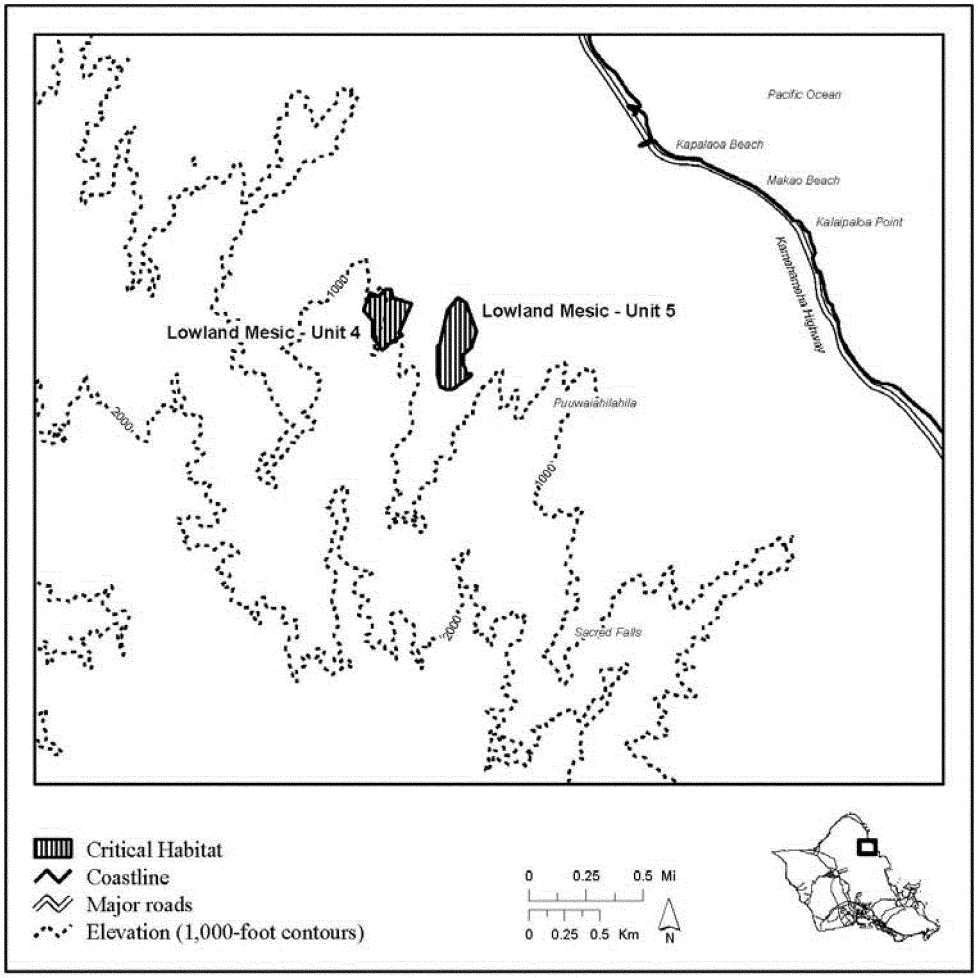
(16) Oahu—Lowland Mesic—Unit 4 (20 ac; 8 ha) and Oahu—Lowland Mesic—Unit 5 (29 ac; 12 ha)

(i) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Alectryon macrococcus, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Ctenitis squamigera, Cyanea acuminata, Cyanea. calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea lanceolata, Cyanea longiflora, Cyanea truncata, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra waiolani, Delissea subcordata, Diellia erecta, Diellia falcata, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Isodendrion laurifolium, Isodendrion longifolium, Kadua coriacea, Labordia cyrtandrae, Lobelia monostachya, Melicope lydgatei, Melicope saint-johnii, Phyllostegia hirsuta, Phyllostegia mollis, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea kaalae, Schiedea nuttallii, Solanum sandwicense, Tetraplasandra gymnocarpa,* and *Tetraplasandra lydgatei*

(ii) [Reserved for textual description of Unit 5.] This unit is critical habitat for *Alectryon macrococcus, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Ctenitis squamigera, Cyanea acuminata, Cyanea. calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea lanceolata, Cyanea longiflora, Cyanea truncata, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra waiolani, Delissea subcordata, Diellia erecta, Diellia. falcata, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Isodendrion laurifolium, Isodendrion longifolium, Kadua coriacea, Labordia cyrtandrae, Lobelia monostachya, Melicope lydgatei, Melicope saint-johnii, Phyllostegia hirsuta, Phyllostegia mollis, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea kaalae, Schiedea nuttallii, Solanum sandwicense, Tetraplasandra gymnocarpa,* and *Tetraplasandra lydgatei*

(iii) **Note:** Map of Oahu—Lowland Mesic—Unit 4 and Oahu—Lowland Mesic—Unit 5 (Map 16) follows:

Map 16
Oahu–Lowland Mesic
Unit 4 and Unit 5

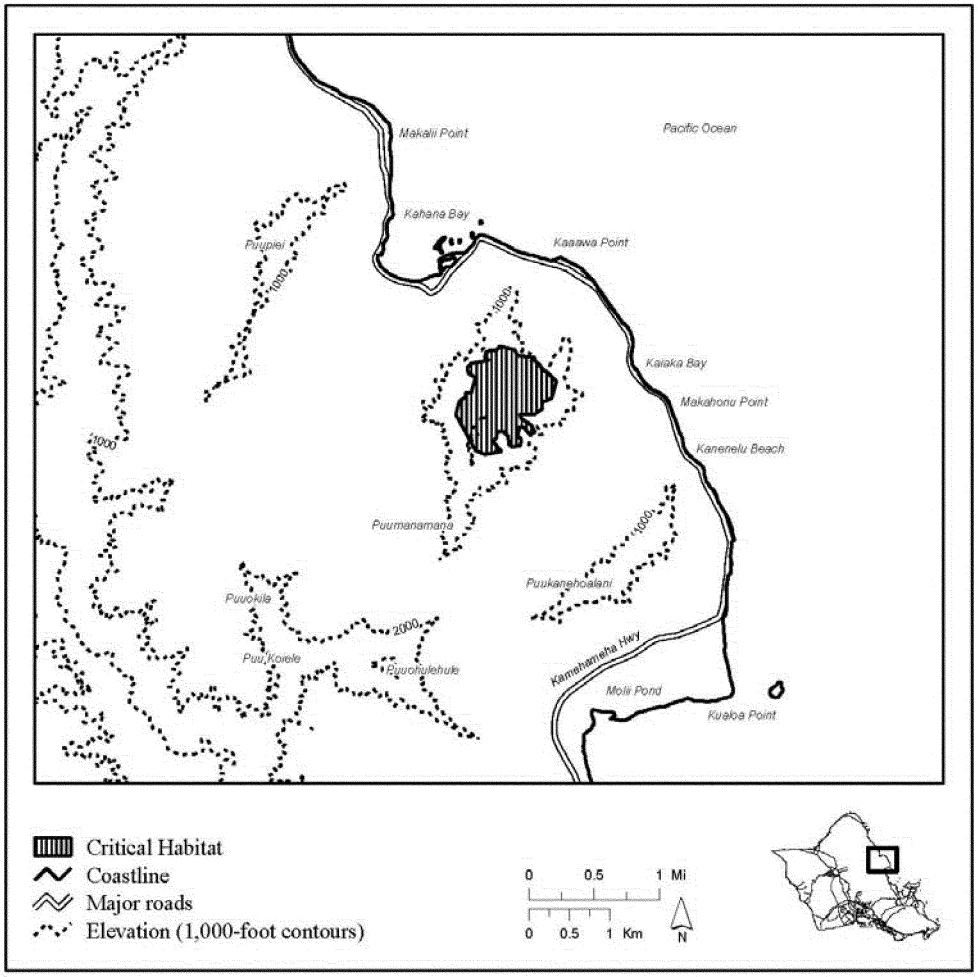


(17) Oahu—Lowland Mesic—Unit 6 (247 ac; 100 ha)

(i) [Reserved for textual description of unit.] This unit is critical habitat for *Alectryon macrococcus Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Ctenitis squamigera, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea lanceolata, Cyanea longiflora, Cyanea truncata, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra waiolani, Delissea subcordata, Diellia erecta, Diellia falcata, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Isodendrion laurifolium, Isodendrion longifolium, Kadua coriacea, Labordia cyrtandrae, Lobelia monostachya, Melicope lydgatei, Melicope saint-johnii, Phyllostegia hirsuta, Phyllostegia mollis, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea kaalae, Schiedea nuttallii, Solanum sandwicense, Tetraplasandra gymnocarpa,* and *Tetraplasandra lydgatei.*

(ii) **Note:** Map of Oahu—Lowland Mesic—Unit 6 (Map 17) follows:

Map 17
Oahu–Lowland Mesic
Unit 6

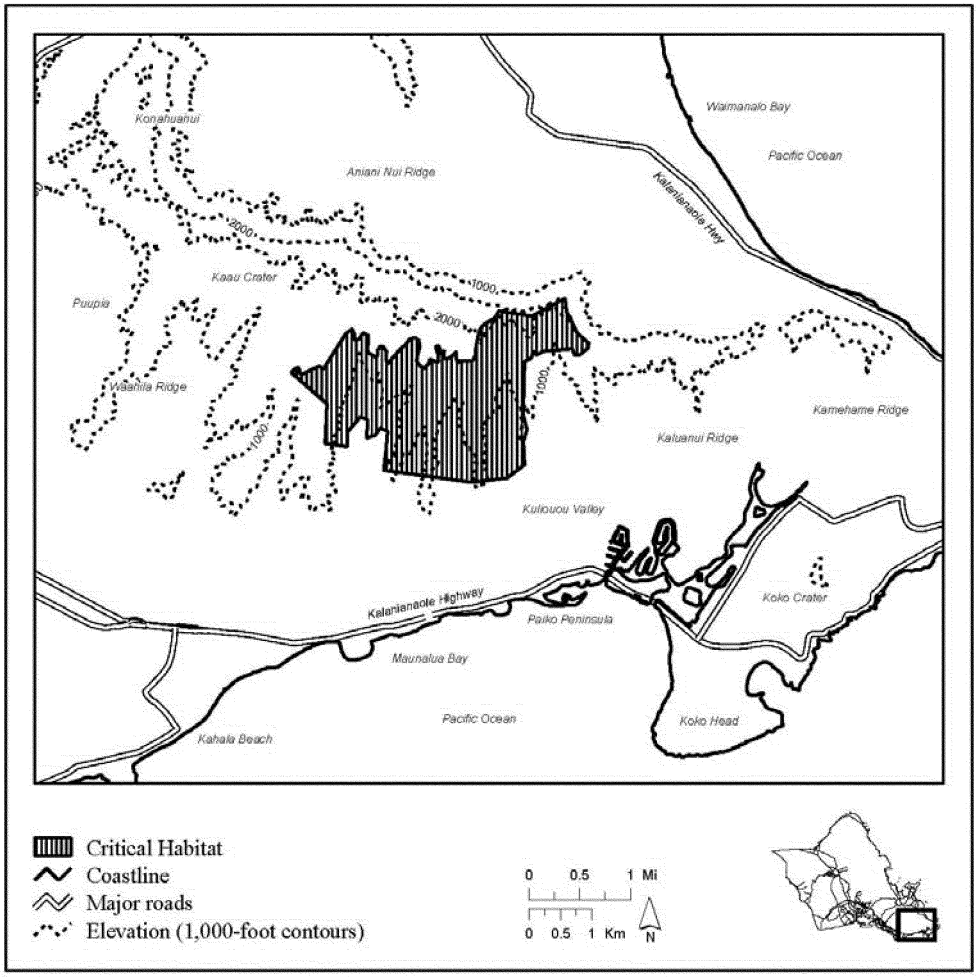


(18) Oahu—Lowland Mesic—Unit 7 (1,669 ac; 676 ha)

(i) [Reserved for textual description of unit.] This unit is critical habitat for *Alectryon macrococcus, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Ctenitis squamigera, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea lanceolata, Cyanea longiflora, Cyanea truncata, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra waiolani, Delissea subcordata, Diellia erecta, Diellia falcata, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Isodendrion laurifolium, Isodendrion longifolium, Kadua coriacea, Labordia cyrtandrae, Lobelia monostachya, Melicope lydgatei, Melicope saint-johnii, Phyllostegia hirsuta, Phyllostegia mollis, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea kaalae, Schiedea nuttallii, Solanum sandwicense, Tetraplasandra gymnocarpa,* and *Tetraplasandra lydgatei.*

(ii) **Note:** Map of Oahu—Lowland Mesic—Unit 7 (Map 18) follows:

Map 18
Oahu–Lowland Mesic
Unit 7

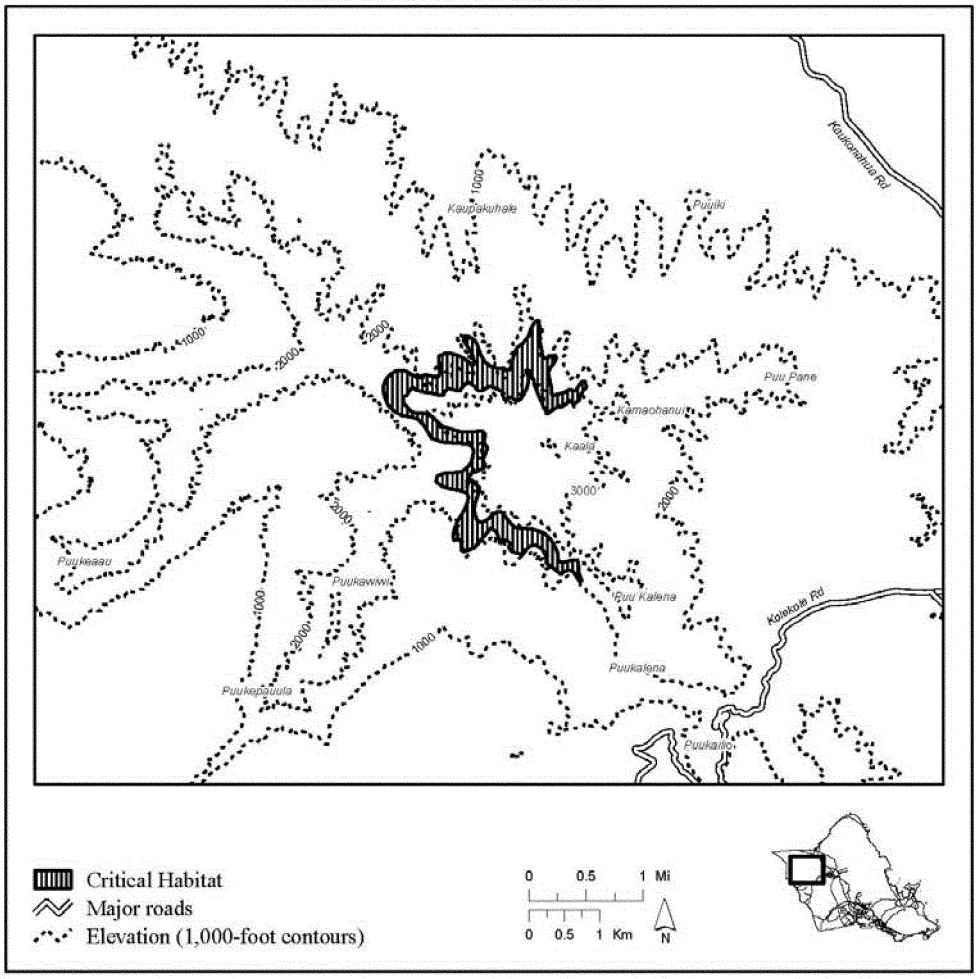


(19) Oahu—Lowland Wet—Unit 1 (541 ac; 219 ha)

(i) [Reserved for textual description of unit.] This unit is critical habitat for *Cyanea acuminata, Cyanea calycina, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diplazium molokaiense, Gardenia mannii, Gouania vitifolia, Hesperomannia arbuscula, Isodendrion longifolium, Labordia cyrtandrae, Lobelia oahuensis, Melicope makahae, Phyllostegia hirsuta, Phyllostegia mollis, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Urera kaalae.*

(ii) **Note:** Map of Oahu—Lowland Wet—Unit 1 (Map 19) follows:

Map 19
Oahu–Lowland Wet
Unit 1



(20) Oahu—Lowland Wet—Unit 2 (20 ac; 8 ha), Oahu—Lowland Wet—Unit 3 (29 ac; 12 ha), and Oahu—Lowland Wet—Unit 4 (27 ac; 11 ha)

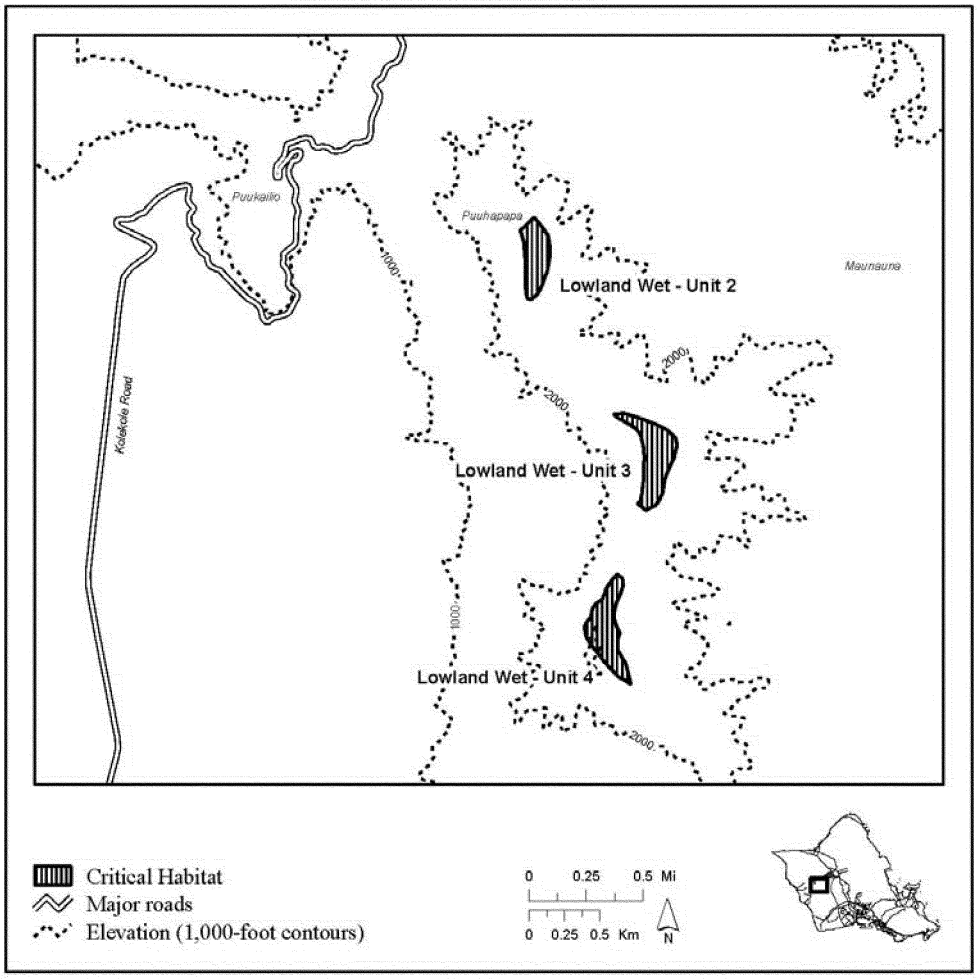
(i) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Cyanea acuminata, Cyanea. calycina, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diplazium molokaiense, Gardenia mannii, Gouania vitifolia, Hesperomannia arbuscula, Isodendrion longifolium, Labordia cyrtandrae, Lobelia oahuensis, Melicope makahae, Phyllostegia hirsuta, Phyllostegia mollis, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Urera kaalae.*

(ii) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Cyanea acuminata, Cyanea. calycina, Cyanea. grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diplazium molokaiense, Gardenia mannii, Gouania vitifolia, Hesperomannia arbuscula, Isodendrion longifolium, Labordia cyrtandrae, Lobelia oahuensis, Melicope makahae, Phyllostegia hirsuta, Phyllostegia mollis, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Urera kaalae.*

(iii) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Cyanea acuminata, Cyanea calycina, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diplazium molokaiense, Gardenia mannii, Gouania vitifolia, Hesperomannia arbuscula, Isodendrion longifolium, Labordia cyrtandrae, Lobelia oahuensis, Melicope makahae, Phyllostegia hirsuta, Phyllostegia mollis, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Urera kaalae.*

(iv) **Note:** Map of Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, and Oahu—Lowland Wet—Unit 4 (Map 20) follows:

Map 20
Oahu–Lowland Wet
Unit 2, Unit 3 and Unit 4

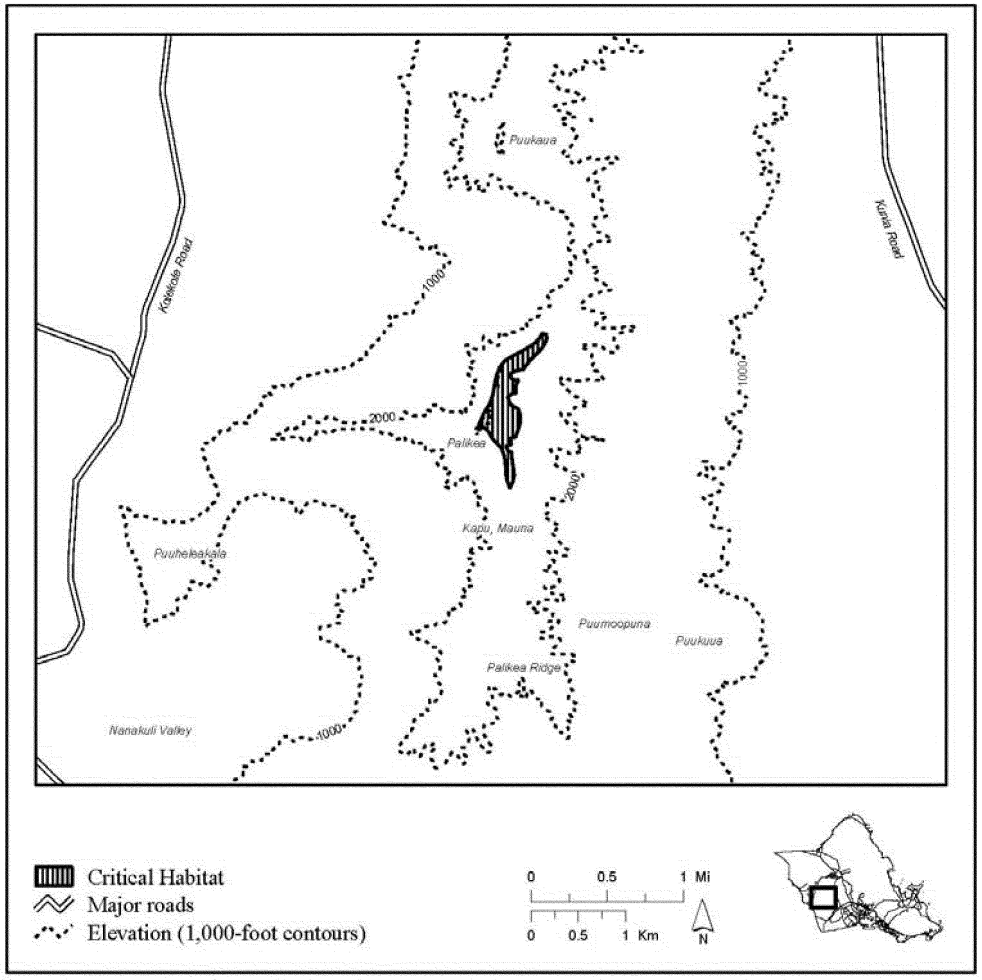


(21) Oahu—Lowland Wet—Unit 5 (76 ac; 31 ha)

(i) [Reserved for textual description of unit.] This unit is critical habitat for *Cyanea acuminata, Cyanea calycina, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diplazium molokaiense, Gardenia mannii, Gouania vitifolia, Hesperomannia arbuscula, Isodendrion longifolium, Labordia cyrtandrae, Lobelia oahuensis, Melicope makahae, Phyllostegia hirsuta, Phyllostegia mollis, Plantago princeps* var. *princeps, Pleomele forbesii, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Urera kaalae.*

(ii) **Note:** Map of Oahu—Lowland Wet—Unit 5 (Map 21) follows:

Map 21
Oahu–Lowland Wet
Unit 5



(22) Oahu—Lowland Wet—Unit 6 (790 ac; 320 ha), Oahu—Lowland Wet–Unit 7 (1,790 ac; 724 ha), and Oahu—Lowland Wet—Unit 8 (3,041 ac; 1,231 ha)

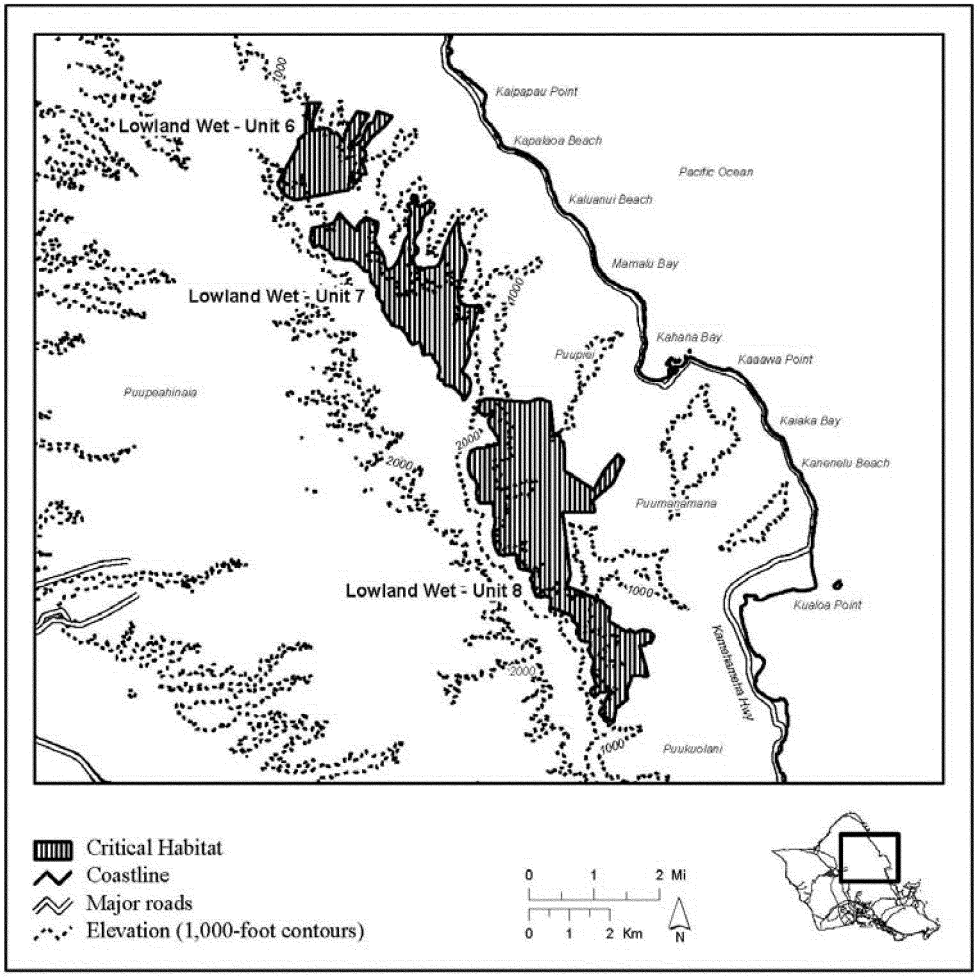
(i) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea lanceolata, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra polyantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Cyrtandra waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope hiiakae, Melicope lydgatei, Myrsine juddii, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, Plantago princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* and *Zanthoxylum oahuense.*

(ii) [Reserved for textual description of Unit 7.] This unit is critical habitat for *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea lanceolata, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra polyantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Cyrtandra waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope hiiakae, Melicope lydgatei, Myrsine juddii, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, Plantago princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* and *Zanthoxylum oahuense.*

(iii) [Reserved for textual description of Unit 8.] This unit is critical habitat for *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea lanceolata, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra polyantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Cyrtandra waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope hiiakae, Melicope lydgatei, Myrsine juddii, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, Plantago princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* and *Zanthoxylum oahuense.*

(iv) **Note:** Map of Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, and Oahu—Lowland Wet—Unit 8 (Map 22) follows:

Map 22
Oahu–Lowland Wet
Unit 6, Unit 7 and Unit 8

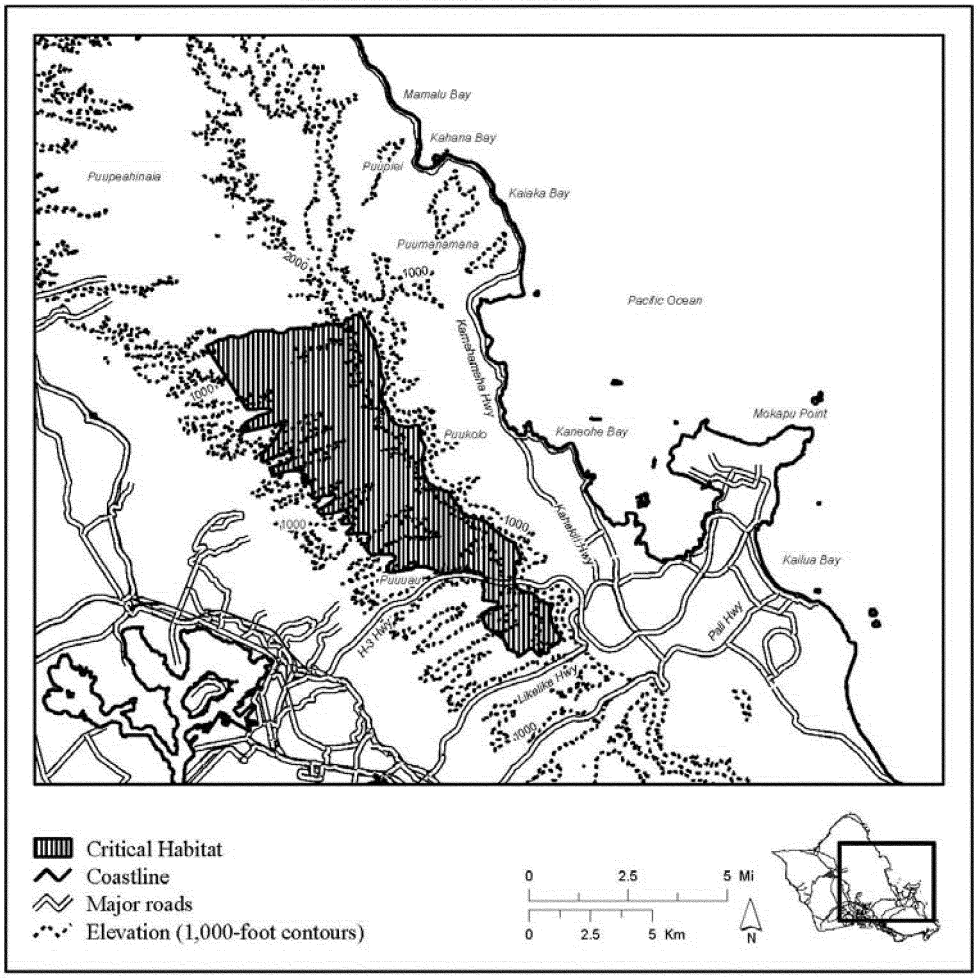


(23) Oahu—Lowland Wet—Unit 9 (15,728 ac; 6,365 ha)

(i) [Reserved for textual description of unit.] This unit is critical habitat for *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea lanceolata, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra polyantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Cyrtandra waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope hiiakae, Melicope lydgatei, Myrsine juddii, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, Plantago princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* and *Zanthoxylum oahuense.*

(ii) **Note:** Map of Oahu—Lowland Wet—Unit 9 (Map 23) follows:

Map 23
Oahu–Lowland Wet
Unit 9



(24) Oahu—Lowland Wet—Unit 10 (124 ac; 50 ha), Oahu—Lowland Wet—Unit 11 (124 ac; 50 ha), and Oahu—Lowland Wet—Unit 12 (53 ac; 21 ha)

(i) [Reserved for textual description of Unit 10.] This unit is critical habitat for *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea lanceolata, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra polyantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Cyrtandra waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope hiiakae, Melicope lydgatei, Myrsine juddii, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, Plantago princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra*

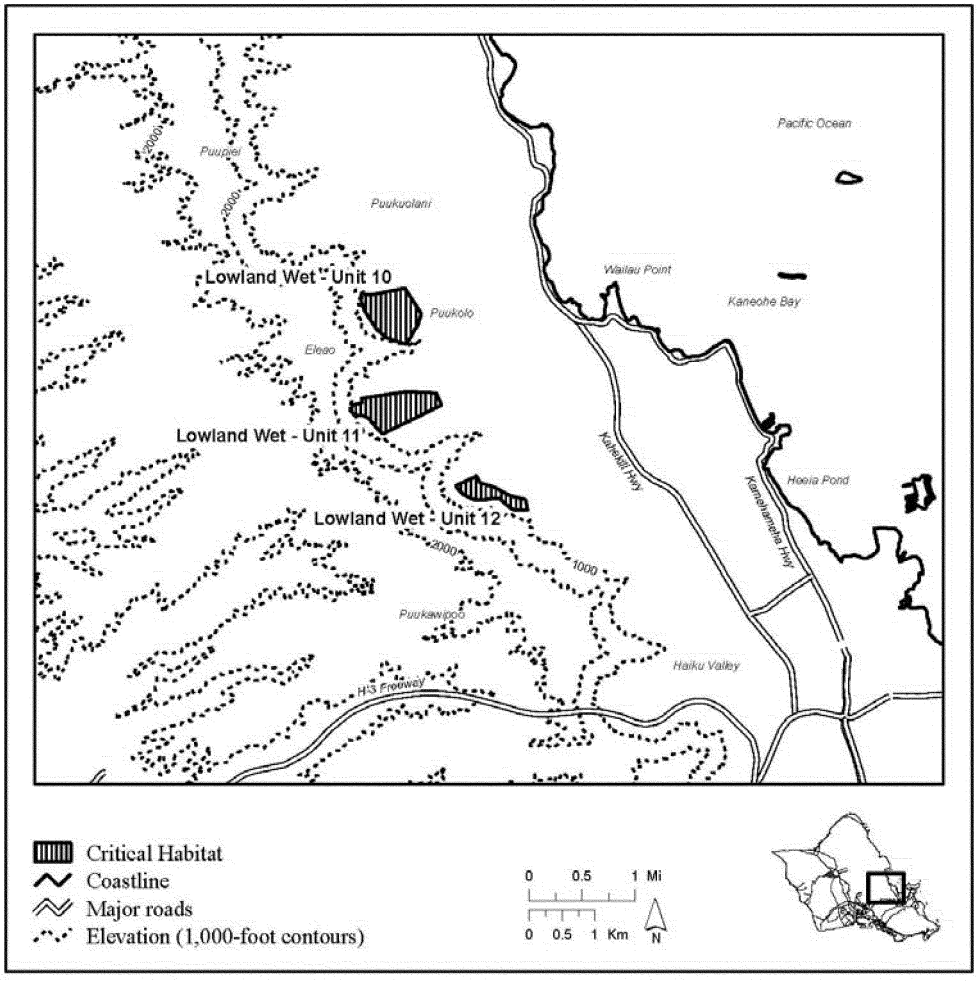
gymnocarpa, Trematolobelia singularis, Viola oahuensis, and *Zanthoxylum oahuense.*

(ii) [Reserved for textual description of Unit 11.] This unit is critical habitat for *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea lanceolata, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra polyantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Cyrtandra waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope hiiakae, Melicope lydgatei, Myrsine juddii, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, Plantago princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* and *Zanthoxylum oahuense.*

(iii) [Reserved for textual description of Unit 12.] This unit is critical habitat for *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea lanceolata, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra polyantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Cyrtandra waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope hiiakae, Melicope lydgatei, Myrsine juddii, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, Plantago princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* and *Zanthoxylum oahuense.*

(iv) **Note:** Map of Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, and Oahu—Lowland Wet—Unit 12 (Map 24) follows:

Map 24
Oahu–Lowland Wet
Unit 10, Unit 11 and Unit 12



(25) Oahu—Lowland Wet—Unit 13 (161 ac; 65 ha), Oahu—Lowland Wet—Unit 14 (478 ac; 193 ha), Oahu—Lowland Wet—Unit 15 (407 ac; 165 ha), and Oahu—Lowland Wet—Unit 16 (2,507 ac; 1,014 ha)

(i) [Reserved for textual description of Unit 13.] This unit is critical habitat for *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea lanceolata, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra polyantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Cyrtandra waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope hiiakae, Melicope lydgatei, Myrsine juddii, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, Plantago princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* and *Zanthoxylum oahuense.*

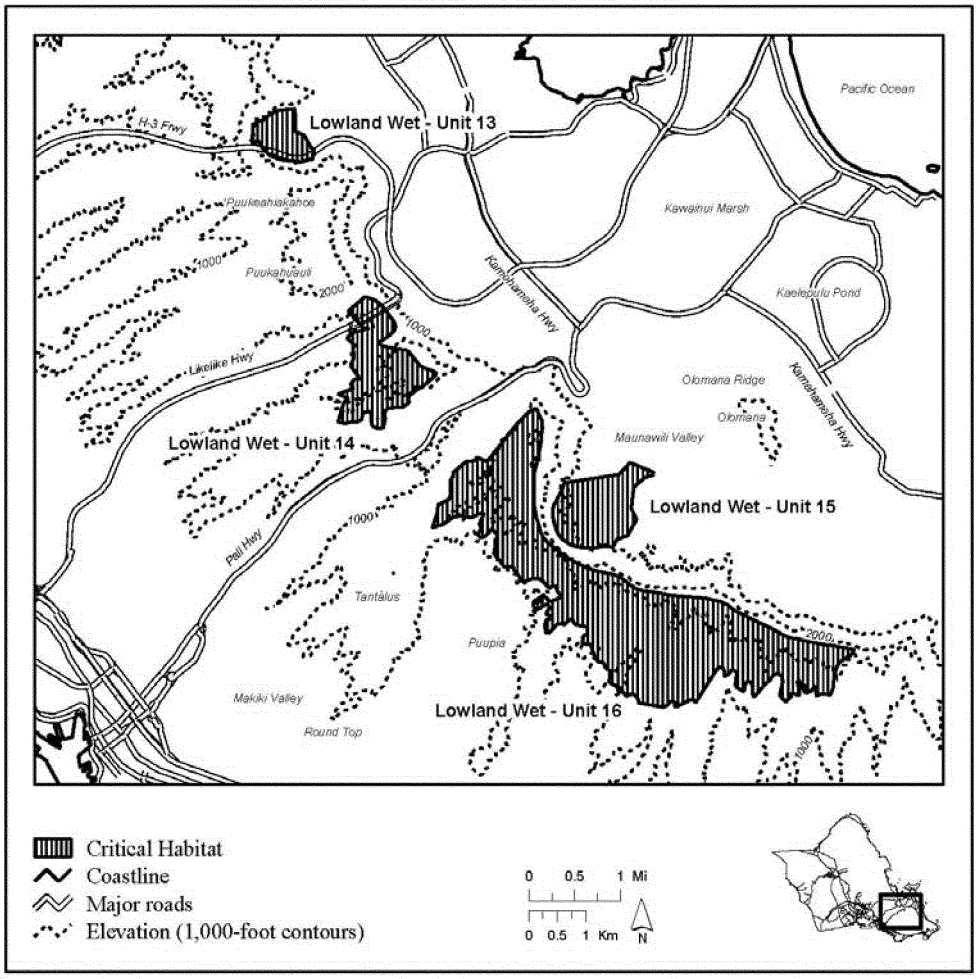
(ii) [Reserved for textual description of Unit 14.] This unit is critical habitat for *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea lanceolata, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra polyantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Cyrtandra waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope hiiakae, Melicope lydgatei, Myrsine juddii, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, Plantago princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* and *Zanthoxylum oahuense.*

(iii) [Reserved for textual description of Unit 15.] This unit is critical habitat for *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea lanceolata, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra polyantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Cyrtandra waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope hiiakae, Melicope lydgatei, Myrsine juddii, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, Plantago princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* and *Zanthoxylum oahuense.*

(iv) [Reserved for textual description of Unit 16.] This unit is critical habitat for *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea lanceolata, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra gracilis, Cyrtandra kaulantha, Cyrtandra polyantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Cyrtandra waiolani, Gardenia mannii, Hesperomannia arborescens, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope hiiakae, Melicope lydgatei, Myrsine juddii, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *longibracteata, Plantago princeps* var. *princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* and *Zanthoxylum oahuense.*

(v) **Note:** Map of Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16 (Map 25) follows:

Map 25
Oahu–Lowland Wet
Unit 13, Unit 14, Unit 15 and Unit 16

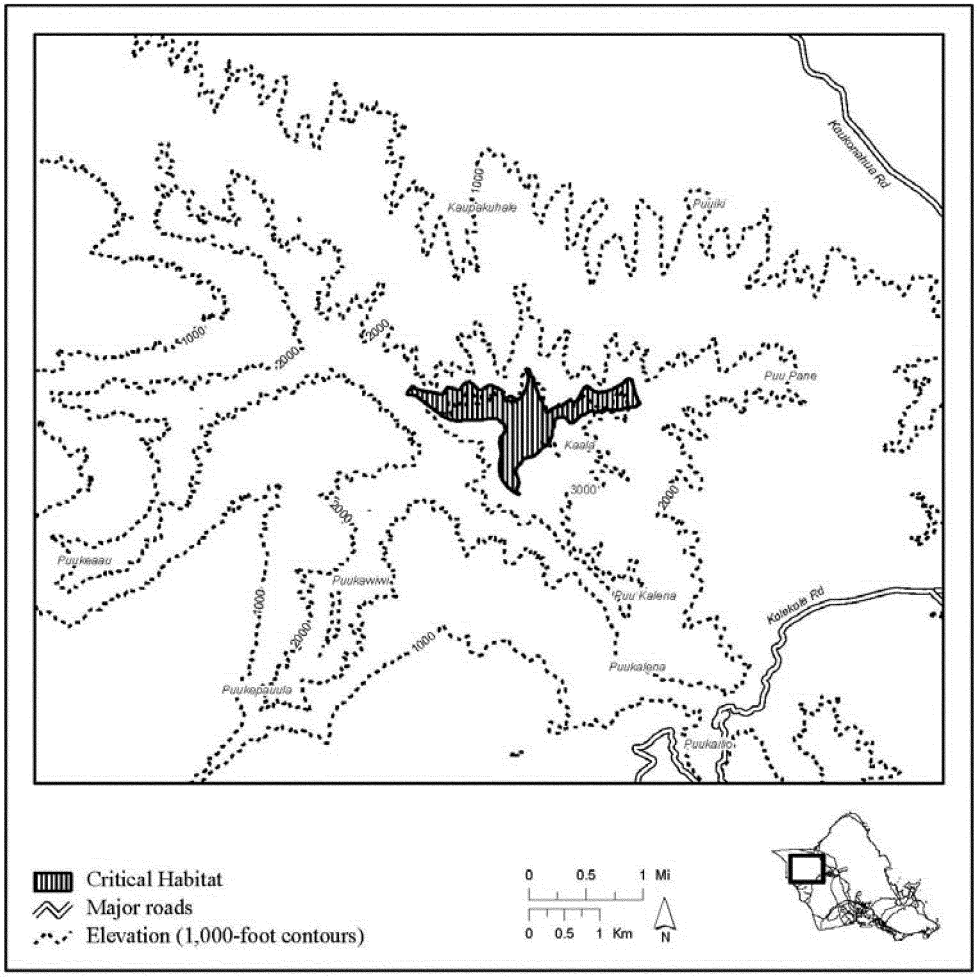


(26) Oahu—Montane Wet—Unit 1 (370 ac; 150 ha)

(i) [Reserved for textual description of unit.] This unit is critical habitat for *Alectryon macrococcus, Cyanea acuminata, Cyanea calycina, Labordia cyrtandrae, Lobelia oahuensis, Melicope christophersenii, Phyllostegia hirsuta,* and *Schiedea trinervis.*

(ii) **Note:** Map of Oahu—Montane Wet—Unit 1 (Map 26) follows:

Map 26
Oahu–Montane Wet
Unit 1



(27) Oahu—Dry Cliff—Unit 1 (49 ac; 20 ha), Oahu—Dry Cliff—Unit 2 (412 ac; 167 ha), and Oahu—Dry Cliff—Unit 3 (450 ac; 182 ha)

(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, Chamaesyce kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, Diellia unisora, Dubautia herbstobatae, Eragrostis fosbergii, Flueggea neowawraea, Gouania meyenii, Gouania vitifolia, Isodendrion laurifolium, Isodendrion pyrifolium, Kadua degeneri, Kadua parvula, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Melicope saint-johnii, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, Schiedea obovata, Schiedea trinervis, Silene lanceolata, Silene perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum,* and *Viola chamissoniana* ssp. *chamissoniana.*

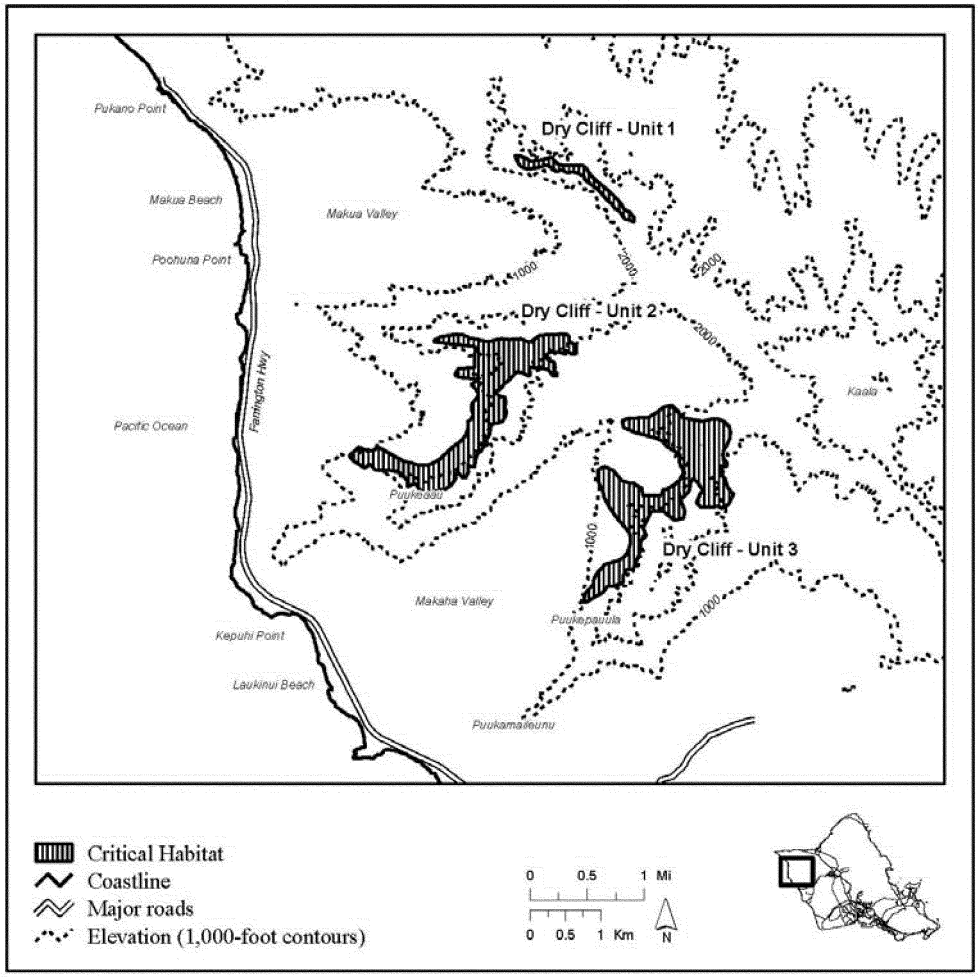
(ii) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, Chamaesyce kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, Diellia unisora, Dubautia herbstobatae, Eragrostis fosbergii, Flueggea neowawraea, Gouania meyenii, Gouania vitifolia, Isodendrion laurifolium, Isodendrion pyrifolium, Kadua degeneri, Kadua parvula, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Melicope*

saint-johnii, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, Schiedea obovata, Schiedea trinervis, Silene lanceolata, Silene perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum,* and *Viola chamissoniana* ssp. *chamissoniana.*

(iii) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, Chamaesyce kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, Diellia unisora, Dubautia herbstobatae, Eragrostis fosbergii, Flueggea neowawraea, Gouania meyenii, Gouania vitifolia, Isodendrion laurifolium, Isodendrion pyrifolium, Kadua degeneri, Kadua parvula, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Melicope saint-johnii, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, Schiedea obovata, Schiedea trinervis, Silene lanceolata, Silene perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum,* and *Viola chamissoniana* ssp. *chamissoniana.*

(iv) **Note:** Map of Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, and Oahu—Dry Cliff—Unit 3 (Map 27) follows:

Map 27
Oahu–Dry Cliff
Unit 1, Unit 2 and Unit 3



(28) Oahu—Dry Cliff—Unit 4 (108 ac; 44 ha), Oahu—Dry Cliff—Unit 5 (26 ac; 10 ha), and Oahu—Dry Cliff—Unit 6 (255 ac; 103 ha)

(i) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, Chamaesyce kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, Diellia unisora, Dubautia herbstobatae, Eragrostis fosbergii, Flueggea neowawraea, Gouania meyenii, Gouania vitifolia, Isodendrion laurifolium, Isodendrion pyrifolium, Kadua*

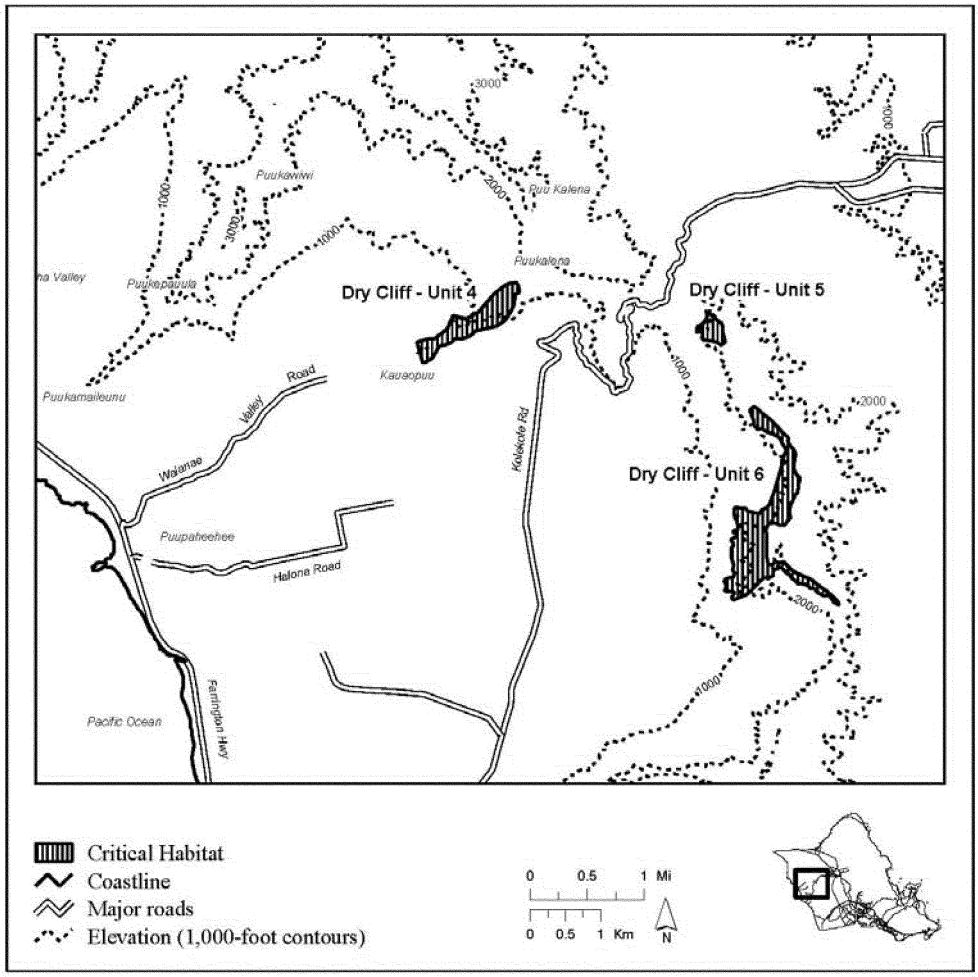
degeneri, Kadua parvula, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Melicope saint-johnii, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, Schiedea obovata, Schiedea trinervis, Silene lanceolata, Silene perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum,* and *Viola chamissoniana* ssp. *chamissoniana.*

(ii) [Reserved for textual description of Unit 5.] This unit is critical habitat for *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, Chamaesyce kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, Diellia unisora, Dubautia herbstobatae, Eragrostis fosbergii, Flueggea neowawraea, Gouania meyenii, Gouania vitifolia, Isodendrion laurifolium, Isodendrion pyrifolium, Kadua degeneri, Kadua parvula, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Melicope saint-johnii, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, Schiedea obovata, Schiedea trinervis, Silene lanceolata, Silene perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum,* and *Viola chamissoniana* ssp. *chamissoniana.*

(iii) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, Chamaesyce kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, Diellia unisora, Dubautia herbstobatae, Eragrostis fosbergii, Flueggea neowawraea, Gouania meyenii, Gouania vitifolia, Isodendrion laurifolium, Isodendrion pyrifolium, Kadua degeneri, Kadua parvula, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Melicope saint-johnii, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, Schiedea obovata, Schiedea trinervis, Silene lanceolata, Silene perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum,* and *Viola chamissoniana* ssp. *chamissoniana.*

(iv) **Note:** Map of Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, and Oahu—Dry Cliff—Unit 6 (Map 28) follows:

Map 28
Oahu–Dry Cliff
Unit 4, Unit 5 and Unit 6



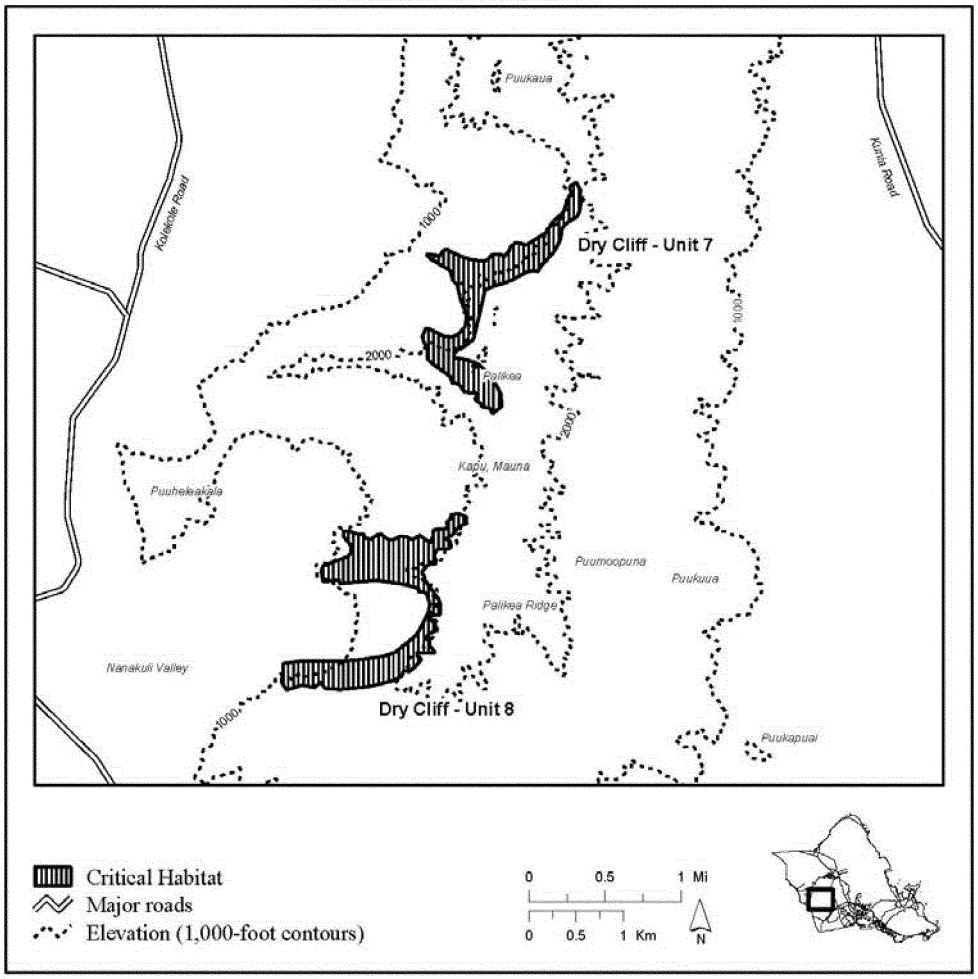
(29) Oahu—Dry Cliff—Unit 7 (208 ac; 84 ha) and Oahu—Dry Cliff—Unit 8 (259 ac; 105 ha)

(i) [Reserved for textual description of Unit 7.] This unit is critical habitat for *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, Chamaesyce kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, Diellia unisora, Dubautia herbstobatae, Eragrostis fosbergii, Flueggea neowawraea, Gouania meyenii, Gouania vitifolia, Isodendrion laurifolium, Isodendrion pyrifolium, Kadua degeneri, Kadua parvula, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Melicope saint-johnii, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, Schiedea obovata, Schiedea trinervis, Silene lanceolata, Silene perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum,* and *Viola chamissoniana* ssp. *chamissoniana.*

(ii) [Reserved for textual description of Unit 8.] This unit is critical habitat for *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, Chamaesyce kuwaleana, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Diellia falcata, Diellia unisora, Dubautia herbstobatae, Eragrostis fosbergii, Flueggea neowawraea, Gouania meyenii, Gouania vitifolia, Isodendrion laurifolium, Isodendrion pyrifolium, Kadua degeneri, Kadua parvula, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Melicope saint-johnii, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps* var. *princeps, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, Schiedea obovata, Schiedea trinervis, Silene lanceolata, Silene perlmanii, Spermolepis hawaiiensis, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum,* and *Viola chamissoniana* ssp. *chamissoniana.*

(iii) **Note:** Map of Oahu—Dry Cliff—Unit 7 and Oahu—Dry Cliff—Unit 8 (Map 29) follows:

Map 29
Oahu–Dry Cliff
Unit 7 and Unit 8

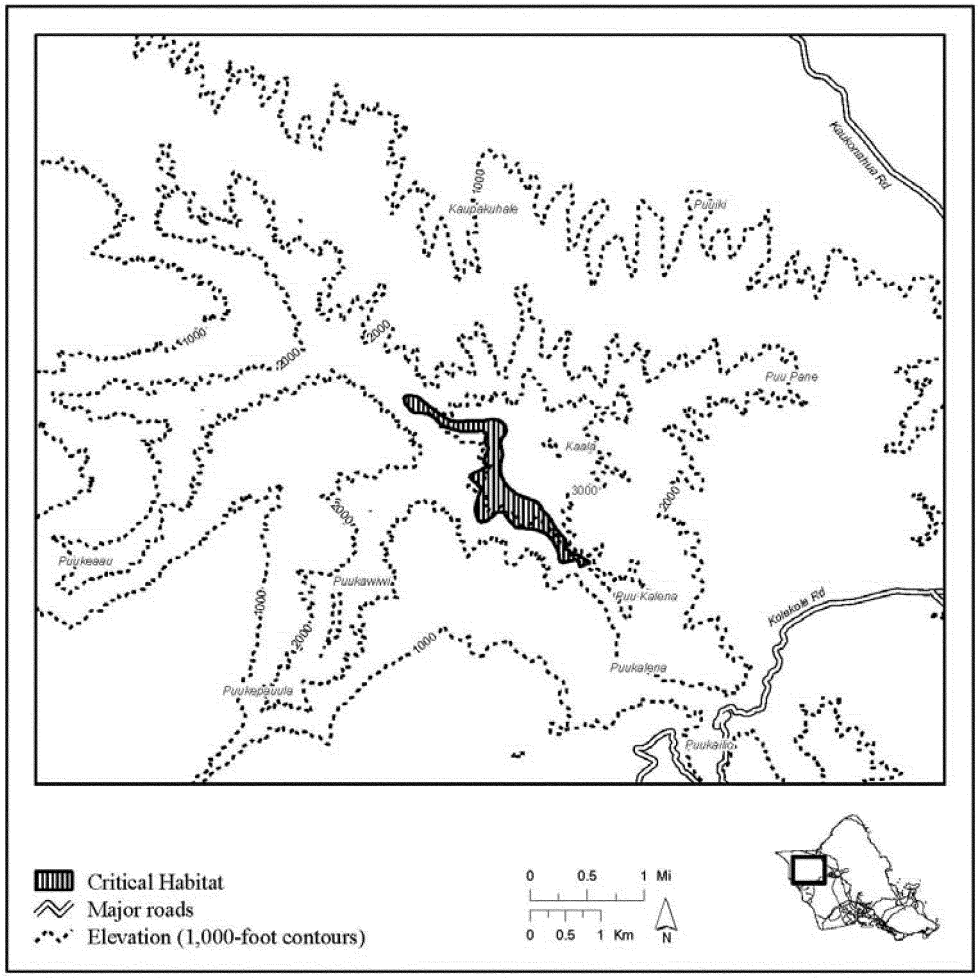


(30) Oahu—Wet Cliff—Unit 1 (235 ac; 95 ha)

(i) [Reserved for textual description of unit 1.] This unit is critical habitat for *Cyanea acuminata, Cyanea calycina, Labordia cyrtandrae, Lobelia oahuensis, Melicope christophersenii, Phyllostegia hirsuta, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Schiedea trinervis.*

(ii) **Note:** Map of Oahu—Wet Cliff—Unit 1 (Map 30) follows:

Map 30
Oahu–Wet Cliff
Unit 1



(31) Oahu—Wet Cliff—Unit 2 (7 ac; 3 ha), Oahu—Wet Cliff—Unit 3 (16 ac; 6 ha), and Oahu—Wet Cliff—Unit 4 (23 ac; 9 ha)

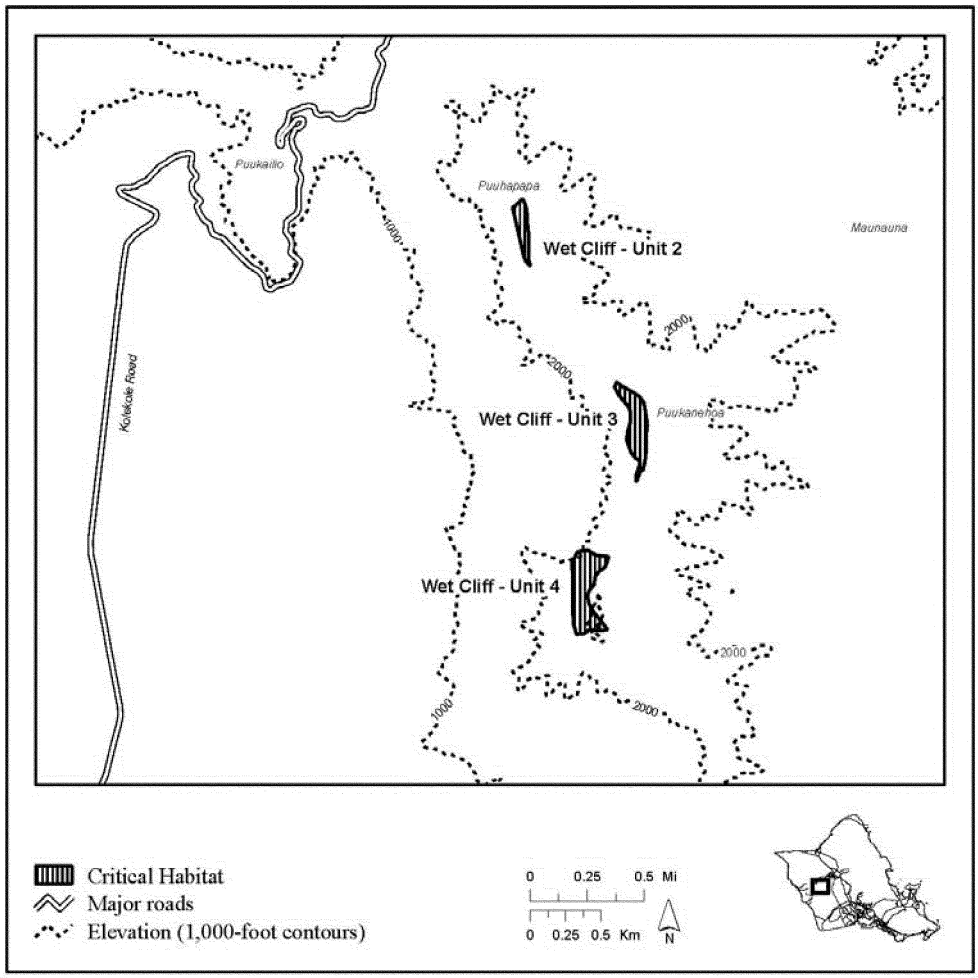
(i) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Cyanea acuminata, Cyanea calycina, Labordia cyrtandrae, Lobelia oahuensis, Melicope christophersenii, Phyllostegia hirsuta, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Schiedea trinervis.*

(ii) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Cyanea acuminata, Cyanea calycina, Labordia cyrtandrae, Lobelia oahuensis, Melicope christophersenii, Phyllostegia hirsuta, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Schiedea trinervis.*

(iii) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Cyanea acuminata, Cyanea calycina, Labordia cyrtandrae, Lobelia oahuensis, Melicope christophersenii, Phyllostegia hirsuta, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Schiedea trinervis.*

(iv) **Note:** Map of Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, and Oahu—Wet Cliff—Unit 4 (Map 31) follows:

Map 31
Oahu–Wet Cliff
Unit 2, Unit 3 and Unit 4

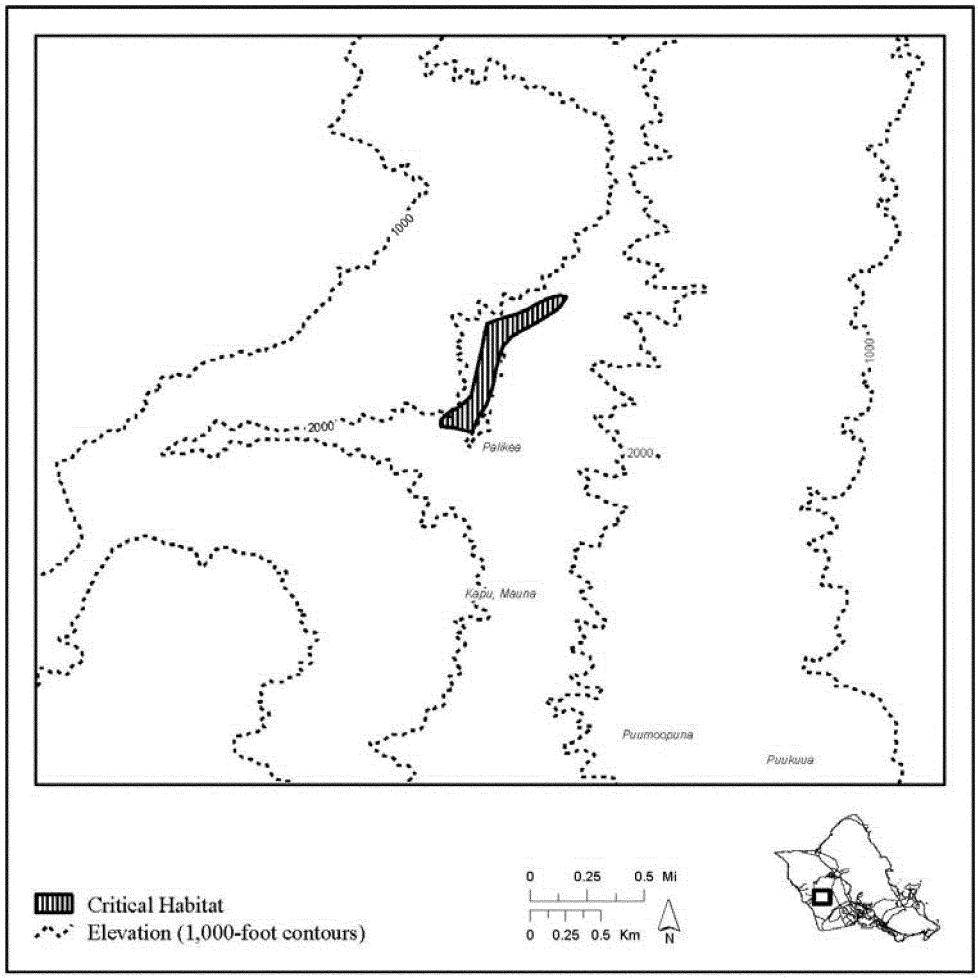


(32) Oahu—Wet Cliff—Unit 5 (43 ac; 17 ha)

(i) [Reserved for textual description of unit 5.] This unit is critical habitat for *Cyanea acuminata, Cyanea calycina, Labordia cyrtandrae, Lobelia oahuensis, Melicope christophersenii, Phyllostegia hirsuta, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Schiedea trinervis.*

(ii) **Note:** Map of Oahu—Wet Cliff—Unit 5 (Map 32) follows:

Map 32
Oahu–Wet Cliff
Unit 5



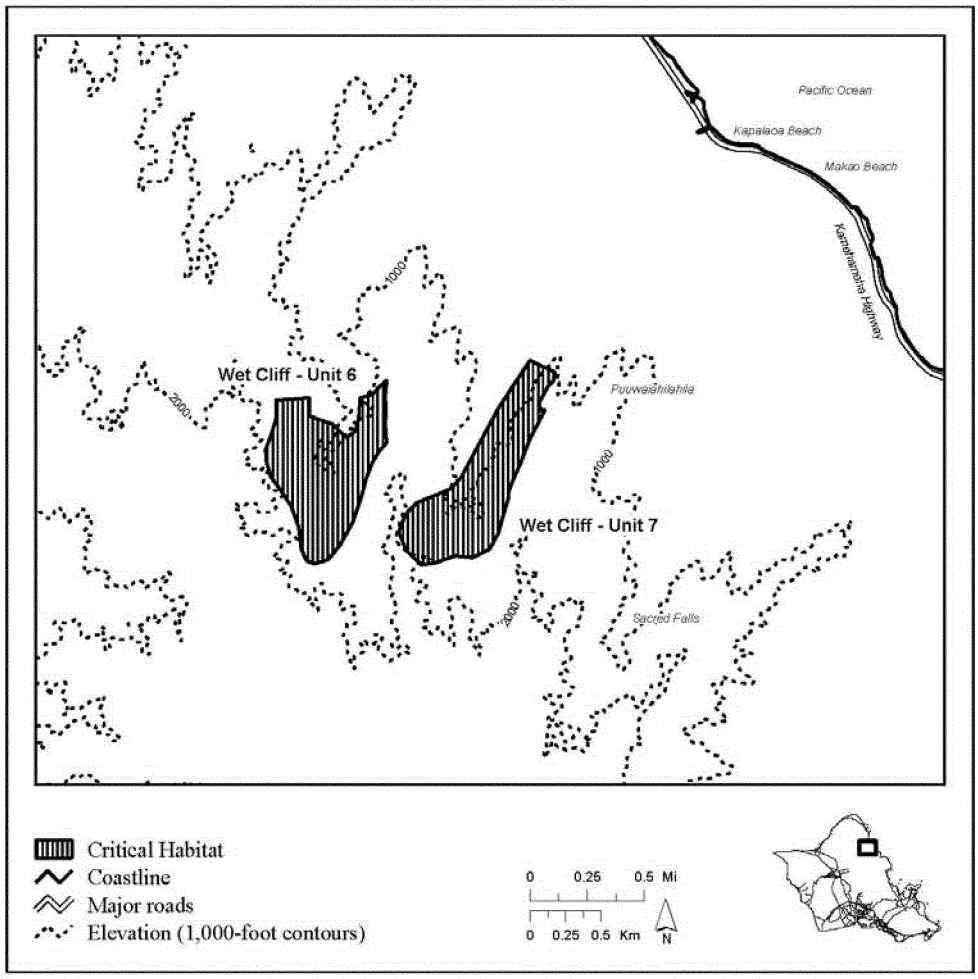
(33) Oahu—Wet Cliff—Unit 6 (151 ac; 61 ha) and Oahu—Wet Cliff—Unit 7 (144 ac; 58 ha)

(i) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Adenophorus periens, Chamaesyce deppeana, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea humboldtiana, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra kaulantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Huperzia nutans, Labordia cyrtandrae, Lobelia oahuensis, Lysimachia filifolia, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *princeps, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Sanicula purpurea, Schiedea kaalae, Tetraplasandra gymnocarpa, Trematolobelia singularis,* and *Viola oahuensis.*

(ii) [Reserved for textual description of Unit 7.] This unit is critical habitat for *Adenophorus periens, Chamaesyce deppeana, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea humboldtiana, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra kaulantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Huperzia nutans, Labordia cyrtandrae, Lobelia oahuensis, Lysimachia filifolia, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *princeps, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Sanicula purpurea, Schiedea kaalae, Tetraplasandra gymnocarpa, Trematolobelia singularis,* and *Viola oahuensis.*

(iii) **Note:** Map of Oahu—Wet Cliff—Unit 6 and Oahu—Wet Cliff—Unit 7 (Map 33) follows:

Map 33
Oahu–Wet Cliff
Unit 6 and Unit 7

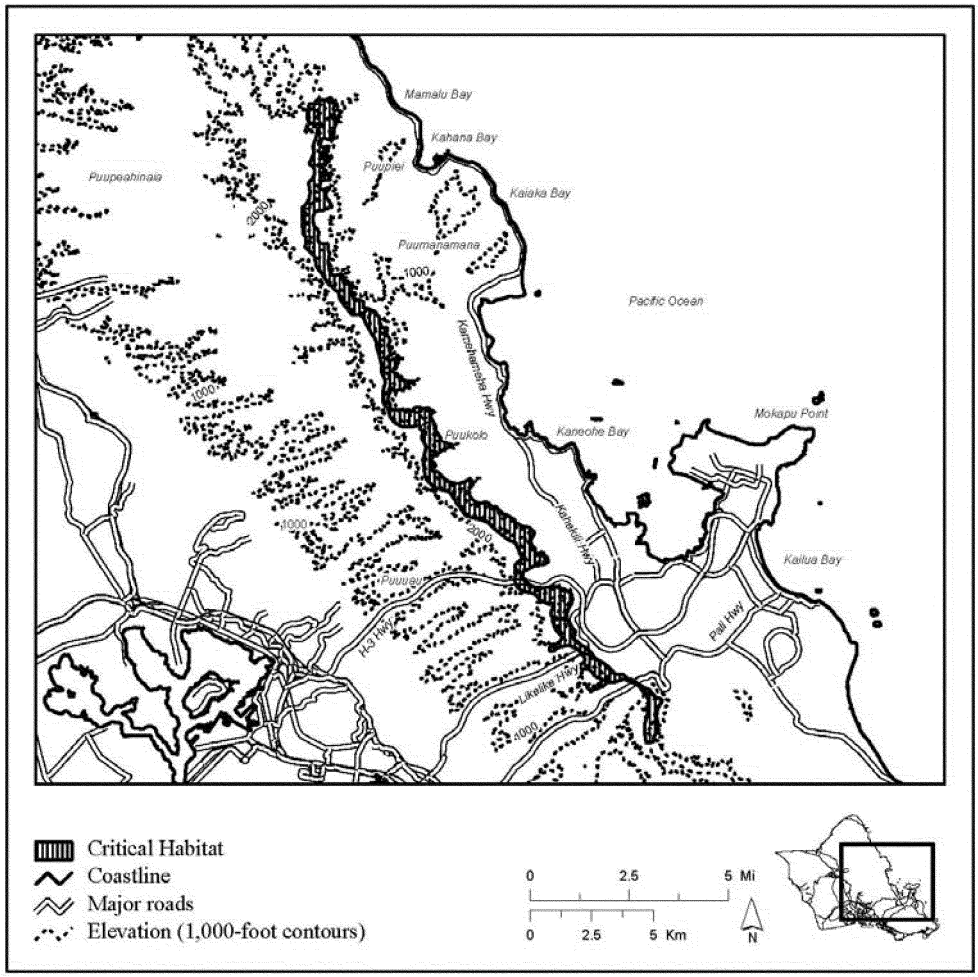


(34) Oahu—Wet Cliff—Unit 8 (4,649 ac; 1,881 ha)

(i) [Reserved for textual description of unit 8.] This unit is critical habitat for *Adenophorus periens, Chamaesyce deppeana, Chamaesyce rockii, Cyanea acuminata, Cyanea calycina, Cyanea crispa, Cyanea humboldtiana, Cyanea purpurellifolia, Cyanea st.-johnii, Cyanea truncata, Cyrtandra kaulantha, Cyrtandra sessilis, Cyrtandra subumbellata, Cyrtandra viridiflora, Huperzia nutans, Labordia cyrtandrae, Lobelia oahuensis, Lysimachia filifolia, Phyllostegia hirsuta, Phyllostegia parviflora* var. *parviflora, Plantago princeps* var. *princeps, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Sanicula purpurea, Schiedea kaalae, Tetraplasandra gymnocarpa, Trematolobelia singularis,* and *Viola oahuensis.*

(ii) **Note:** Map of Oahu—Wet Cliff—Unit 8 (Map 34) follows:

Map 34
Oahu–Wet Cliff
Unit 8



(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU

Unit name	Species occupied	Species unoccupied
Oahu—Coastal—Unit 1		
	Achyranthes splendens var. *rotundata*	*Achyranthes splendens* var. *rotundata*
		Bidens amplectens
		Centaurium sebaeoides
	Chamaesyce celastroides var *kaenana*	*Chamaesyce celastroides* var. *kaenana*
		Schiedea kealiae
	Sesbania tomentosa	*Sesbania tomentosa*
		Vigna o-wahuensis
Oahu—Coastal—Unit 2		
		Centaurium sebaeoides
		Chamaesyce kuwaleana
		Sesbania tomentosa
		Vigna o-wahuensis
Oahu—Coastal—Unit 3		
		Centaurium sebaeoides
		Chamaesyce kuwaleana
		Sesbania tomentosa
		Vigna o-wahuensis
Oahu—Coastal—Unit 4		
		Centaurium sebaeoides
		Chamaesyce kuwaleana
		Sesbania tomentosa
		Vigna o-wahuensis
Oahu—Coastal—Unit 5		
		Centaurium sebaeoides
		Chamaesyce kuwaleana
		Sesbania tomentosa
		Vigna o-wahuensis
Oahu—Coastal—Unit 6		
		Centaurium sebaeoides
		Chamaesyce kuwaleana
		Sesbania tomentosa
		Vigna o-wahuensis
Oahu—Coastal—Unit 7		
		Centaurium sebaeoides
		Chamaesyce kuwaleana
		Sesbania tomentosa
		Vigna o-wahuensis
Oahu—Coastal—Unit 8		
		Centaurium sebaeoides
		Chamaesyce kuwaleana
	Sesbania tomentosa	*Sesbania tomentosa*
		Vigna o-wahuensis
Oahu—Coastal—Unit 9		
		Centaurium sebaeoides
		Chamaesyce kuwaleana
	Cyperus trachysanthos	*Cyperus trachysanthos*
	Marsilea villosa	*Marsilea villosa*
		Sesbania tomentosa
		Vigna o-wahuensis
Oahu—Coastal—Unit 10		
	Centaurium sebaeoides	*Centaurium sebaeoides*
		Chamaesyce kuwaleana
		Sesbania tomentosa
		Vigna o-wahuensis
Oahu—Coastal—Unit 11		
		Centaurium sebaeoides
		Chamaesyce kuwaleana
		Cyperus trachysanthos
	Marsilea villosa	*Marsilea villosa*
		Sesbania tomentosa
		Vigna o-wahuensis
Oahu—Coastal—Unit 12		
		Centaurium sebaeoides
		Chamaesyce kuwaleana
		Cyperus trachysanthos
	Marsilea villosa	*Marsilea villosa*
		Sesbania tomentosa
		Vigna o-wahuensis
Oahu—Coastal—Unit 13		
	Achyranthes splendens var. *rotundata*	*Achyranthes splendens* var. *rotundata*
		Bidens amplectens

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Centaurium sebaeoides *Chamaesyce celastroides* var. *kaenana* *Schiedea kealiae* *Sesbania tomentosa* *Vigna o-wahuensis*
Oahu—Coastal—Unit 14		
	Achyranthes splendens var. *rotundata*	*Achyranthes splendens* var. *rotundata* *Bidens amplectens* *Centaurium sebaeoides* *Chamaesyce celastroides* var. *kaenana* *Schiedea kealiae* *Sesbania tomentosa* *Vigna o-wahuensis*
Oahu—Coastal—Unit 15		
	Achyranthes splendens var. *rotundata*	*Achyranthes splendens* var. *rotundata* *Bidens amplectens* *Centaurium sebaeoides* *Chamaesyce celastroides* var. *kaenana* *Schiedea kealiae* *Sesbania tomentosa* *Vigna o-wahuensis*
Oahu—Lowland Dry—Unit 1		
	Bidens amplectens	*Achyranthes splendens* var. *rotundata* *Bidens amplectens* *Bonamia menziesii* *Chamaesyce celastroides* var. *kaenana* *Euphorbia haeleeleana* *Gouania meyenii* *Gouania vitifolia*
	Hibiscus brackenridgei	*Hibiscus brackenridgei* *Isodendrion pyrifolium* *Melanthera tenuifolia* *Neraudia angulata*
	Nototrichium humile	*Nototrichium humile* *Pleomele forbesii* *Schiedea hookeri*
	Schiedea kealiae	*Schiedea kealiae* *Spermolepis hawaiiensis*
Oahu—Lowland Dry—Unit 2		
	Bonamia menziesii	*Achyranthes splendens* var. *rotundata* *Bidens amplectens* *Bonamia menziesii* *Chamaesyce celastroides* var. *kaenana* *Euphorbia haeleeleana* *Gouania meyenii* *Gouania vitifolia* *Hibiscus brackenridgei* *Isodendrion pyrifolium*
	Melanthera tenuifolia	*Melanthera tenuifolia* *Neraudia angulata*
	Nototrichium humile	*Nototrichium humile*
	Pleomele forbesii	*Pleomele forbesii* *Schiedea hookeri* *Schiedea kealiae* *Spermolepis hawaiiensis*
Oahu—Lowland Dry—Unit 3		
	Marsilea villosa	*Achyranthes splendens* var. *rotundata* *Bidens amplectens* *Bonamia menziesii* *Chamaesyce celastroides* var. *kaenana* *Cyperus trachysanthos* *Euphorbia haeleeleana* *Gouania meyenii* *Gouania vitifolia* *Hibiscus brackenridgei* *Isodendrion pyrifolium* *Marsilea villosa* *Melanthera tenuifolia* *Neraudia angulata* *Nototrichium humile* *Pleomele forbesii* *Schiedea hookeri*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Schiedea kealiae *Spermolepis hawaiiensis*
Oahu—Lowland Dry—Unit 4		
		Achyranthes splendens var. *rotundata* *Bidens amplectens* *Bonamia menziesii* *Chamaesyce celastroides* var. *kaenana* *Cyperus trachysanthos* *Euphorbia haeleeleana* *Gouania meyenii* *Gouania vitifolia* *Hibiscus brackenridgei* *Isodendrion pyrifolium*
	Marsilea villosa	*Marsilea villosa* *Melanthera tenuifolia* *Neraudia angulata* *Nototrichium humile* *Pleomele forbesii* *Schiedea hookeri* *Schiedea kealiae* *Spermolepis hawaiiensis*
Oahu—Lowland Dry—Unit 5		
		Achyranthes splendens var. *rotundata* *Bidens amplectens* *Bonamia menziesii* *Chamaesyce celastroides* var. *kaenana*
	Cyperus trachysanthos	*Cyperus trachysanthos* *Euphorbia haeleeleana* *Gouania meyenii* *Gouania vitifolia* *Hibiscus brackenridgei* *Isodendrion pyrifolium* *Marsilea villosa* *Melanthera tenuifolia* *Neraudia angulata* *Nototrichium humile* *Pleomele forbesii* *Schiedea hookeri* *Schiedea kealiae* *Spermolepis hawaiiensis*
Oahu—Lowland Dry—Unit 6		
	Doryopteris takeuchii	*Doryopteris takeuchii* *Gouania meyenii*
	Spermolepis hawaiiensis	*Spermolepis hawaiiensis*
Oahu—Lowland Dry—Unit 7		
	Cyperus trachysanthos	*Cyperus trachysanthos* *Doryopteris takeuchii* *Gouania meyenii* *Marsilea villosa* *Spermolepis hawaiiensis*
Oahu—Lowland Dry—Unit 8		
		Achyranthes splendens var. *rotundata* *Bidens amplectens* *Bonamia menziesii* *Chamaesyce celastroides* var. *kaenana* *Chamaesyce skottsbergii* var. *skottsbergii* *Euphorbia haeleeleana* *Gouania meyenii* *Gouania vitifolia* *Hibiscus brackenridgei* *Isodendrion pyrifolium* *Melanthera tenuifolia* *Neraudia angulata* *Nototrichium humile* *Pleomele forbesii* *Schiedea hookeri* *Schiedea kealiae* *Spermolepis hawaiiensis*
Oahu—Lowland Dry—Unit 9		
	Achyranthes splendens var. *rotundata*	*Achyranthes splendens* var. *rotundata* *Bidens amplectens* *Bonamia menziesii*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Chamaesyce celastroides var. *kaenana*
		Chamaesyce skottsbergii var. *skottsbergii*
		Euphorbia haeleeleana
		Gouania meyenii
		Gouania vitifolia
		Hibiscus brackenridgei
		Isodendrion pyrifolium
		Melanthera tenuifolia
		Neraudia angulata
		Nototrichium humile
		Pleomele forbesii
		Schiedea hookeri
		Schiedea kealiae
		Spermolepis hawaiiensis
Oahu—Lowland Dry—Unit 10		
		Achyranthes splendens var. *rotundata*
		Bidens amplectens
		Bonamia menziesii
		Chamaesyce celastroides var. *kaenana*
	Chamaesyce skottsbergii var. *skottsbergii*	*Chamaesyce skottsbergii* var. *skottsbergii*
		Euphorbia haeleeleana
		Gouania meyenii
		Gouania vitifolia
		Hibiscus brackenridgei
		Isodendrion pyrifolium
		Melanthera tenuifolia
		Neraudia angulata
		Nototrichium humile
		Pleomele forbesii
		Schiedea hookeri
		Schiedea kealiae
		Spermolepis hawaiiensis
Oahu—Lowland Dry—Unit 11		
		Achyranthes splendens var. *rotundata*
		Bidens amplectens
		Bonamia menziesii
		Chamaesyce celastroides var. *kaenana*
	Chamaesyce skottsbergii var. *skottsbergii*	*Chamaesyce skottsbergii* var. *skottsbergii*
		Euphorbia haeleeleana
		Gouania meyenii
		Gouania vitifolia
		Hibiscus brackenridgei
		Isodendrion pyrifolium
		Melanthera tenuifolia
		Neraudia
		Nototrichium humile
		Pleomele forbesii
		Schiedea hookeri
		Schiedea kealiae
		Spermolepis hawaiiensis
Oahu—Lowland Mesic—Unit 1		
	Abutilon sandwicense	*Abutilon sandwicense*
	Alectryon macrococcus	*Alectryon macrococcus*
	Bonamia menziesii	*Bonamia menziesii*
	Cenchrus agrimonioides	*Cenchrus agrimonioides*
		Chamaesyce celastroides var. *kaenana*
	Chamaesyce herbstii	*Chamaesyce herbstii*
	Colubrina oppositifolia	*Colubrina oppositifolia*
	Ctenitis squamigera	*Ctenitis squamigera*
	Cyanea acuminata	*Cyanea acuminata*
	Cyanea calycina	*Cyanea calycina*
	Cyanea grimesiana ssp. *grimesiana*	*Cyanea grimesiana* ssp. *grimesiana*
	Cyanea grimesiana ssp. *obatae*	*Cyanea grimesiana* ssp. *obatae*
	Cyanea longiflora	*Cyanea longiflora*
		Cyanea pinnatifida
	Cyanea superba	*Cyanea superba*
		Cyperus pennatiformis
	Cyrtandra dentata	*Cyrtandra dentata*
	Delissea subcordata	*Delissea subcordata*
	Diellia falcata	*Diellia falcata*
		Diellia unisora
		Diplazium molokaiense

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
	Dubautia herbstobatae	*Dubautia herbstobatae*
	Eragrostis fosbergii	*Eragrostis fosbergii*
		Eugenia koolauensis
	Euphorbia haeleeleana	*Euphorbia haeleeleana*
	Flueggea neowawraea	*Flueggea neowawraea*
		Gardenia mannii
		Gouania meyenii
		Gouania vitifolia
	Hesperomannia arborescens	*Hesperomannia arborescens*
	Hesperomannia arbuscula	*Hesperomannia arbuscula*
	Hibiscus brackenridgei	*Hibiscus brackenridgei*
	Isodendrion laurifolium	*Isodendrion laurifolium*
	Isodendrion longifolium	*Isodendrion longifolium*
		Kadua coriacea
	Kadua degeneri	*Kadua degeneri*
		Kadua parvula
		Labordia cyrtandrae
	Lobelia niihauensis	*Lobelia niihauensis*
	Melanthera tenuifolia	*Melanthera tenuifolia*
	Melicope makahae	*Melicope makahae*
	Melicope pallida	*Melicope pallida*
		Melicope saint-johnii
	Neraudia angulata	*Neraudia angulat*
	Nototrichium humile	*Nototrichium humile*
		Phyllostegia hirsuta
	Phyllostegia kaalaensis	*Phyllostegia kaalaensis*
		Phyllostegia mollis
		Phyllostegia parviflora var. *lydgatei*
		Plantago princeps var. *princeps*
	Platydesma cornuta var. *decurrens*	*Platydesma cornuta* var. *decurrens*
	Pleomele forbesii	*Pleomele forbesii*
	Pteralyxia macrocarpa	*Pteralyxia macrocarpa*
		Sanicula mariversa
	Schiedea hookeri	*Schiedea hookeri*
	Schiedea kaalae	*Schiedea kaalae*
	Schiedea nuttallii	*Schiedea nuttallii*
	Schiedea obovata	*Schiedea obovata*
		Silene perlmanii
		Solanum sandwicense
		Stenogyne kanehoana
		Tetramolopium lepidotum ssp. *lepidotum*
		Urera kaalae
	Viola chamissoniana ssp. *chamissoniana*	*Viola chamissoniana* ssp. *chamissoniana*
Oahu—Lowland Mesic—Unit 2		
	Abutilon sandwicense	*Abutilon sandwicense*
	Alectryon macrococcus	*Alectryon macrococcus*
		Bonamia menziesii
	Cenchrus agrimonioides	*Cenchrus agrimonioides*
		Chamaesyce celastroides var. *kaenana*
	Chamaesyce herbstii	*Chamaesyce herbstii*
		Colubrina oppositifolia
		Ctenitis squamigera
		Cyanea acuminata
	Cyanea calycina	*Cyanea calycina*
		Cyanea grimesiana ssp. *grimesiana*
	Cyanea grimesiana ssp. *obatae*	*Cyanea grimesiana* ssp. *obatae*
		Cyanea longiflora
		Cyanea pinnatifida
		Cyanea superba
		Cyperus pennatiformis
		Cyrtandra dentata
	Delissea subcordata	*Delissea subcordata*
	Diellia falcata	*Diellia falcata*
		Diellia unisora
		Diplazium molokaiense
		Dubautia herbstobatae
		Eragrostis fosbergii
		Eugenia koolauensis
		Euphorbia haeleeleana
		Flueggea neowawraea
	Gardenia mannii	*Gardenia mannii*
		Gouania meyenii

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Gouania vitifolia
		Hesperomannia arborescens
		Hesperomannia arbuscula
		Hibiscus brackenridgei
		Isodendrion laurifolium
		Isodendrion longifolium
		Kadua coriacea
		Kadua degeneri
		Kadua parvula
		Labordia cyrtandrae
		Lobelia niihauensis
		Melanthera tenuifolia
		Melicope makahae
		Melicope pallida
		Melicope saint-johnii
		Neraudia angulata
		Nototrichium humile
	Phyllostegia hirsuta	*Phyllostegia hirsuta*
	Phyllostegia kaalaensis	*Phyllostegia kaalaensis*
	Phyllostegia mollis	*Phyllostegia mollis*
		Phyllostegia parviflora var. *lydgatei*
		Plantago princeps var. *princeps*
	Platydesma cornuta var. *decurrens*	*Platydesma cornuta* var. *decurrens*
	Pleomele forbesii	*Pleomele forbesii*
	Pteralyxia macrocarpa	*Pteralyxia macrocarpa*
		Sanicula mariversa
	Schiedea hookeri	*Schiedea hookeri*
	Schiedea kaalae	*Schiedea kaalae*
		Schiedea nuttallii
		Schiedea obovata
		Silene perlmanii
	Solanum sandwicense	*Solanum sandwicense*
	Stenogyne kanehoana	*Stenogyne kanehoana*
		Tetramolopium lepidotum ssp. *lepidotum*
	Urera kaalae	*Urera kaalae*
		Viola chamissoniana ssp. *chamissoniana*
Oahu—Lowland Mesic—Unit 3		
		Abutilon sandwicense
	Alectryon macrococcus	*Alectryon macrococcus*
		Bonamia menziesii
	Cenchrus agrimonioides	*Cenchrus agrimonioides*
		Chamaesyce celastroides var. *kaenana*
		Chamaesyce herbstii
		Colubrina oppositifolia
		Ctenitis squamigera
		Cyanea acuminata
		Cyanea calycina
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea grimesiana ssp. *obatae*
		Cyanea longiflora
		Cyanea pinnatifida
		Cyanea superba
		Cyperus pennatiformis
		Cyrtandra dentata
	Delissea subcordata	*Delissea subcordata*
	Diellia falcata	*Diellia falcata*
	Diellia unisora	*Diellia unisora*
		Diplazium molokaiense
		Dubautia herbstobatae
		Eragrostis fosbergii
		Eugenia koolauensis
		Euphorbia haeleeleana
		Flueggea neowawraea
		Gardenia mannii
		Gouania meyenii
		Gouania vitifolia
		Hesperomannia arborescens
	Hesperomannia arbuscula	*Hesperomannia arbuscula*
		Hibiscus brackenridgei
		Isodendrion laurifolium
		Isodendrion longifolium
		Kadua coriacea

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Kadua degeneri
		Kadua parvula
		Labordia cyrtandrae
		Lobelia niihauensis
		Melanthera tenuifolia
		Melicope makahae
		Melicope pallida
	Melicope saint-johnii	*Melicope saint-johnii*
		Neraudia angulata
		Nototrichium humile
		Phyllostegia hirsuta
		Phyllostegia kaalaensis
	Phyllostegia mollis	*Phyllostegia mollis*
	Phyllostegia parviflora var. *lydgatei*	*Phyllostegia parviflora* var. *lydgatei*
	Plantago princeps var. *princeps*	*Plantago princeps* var. *princeps*
		Platydesma cornuta var. *decurrens*
	Pleomele forbesii	*Pleomele forbesii*
	Pteralyxia macrocarpa	*Pteralyxia macrocarpa*
		Sanicula mariversa
		Schiedea hookeri
	Schiedea kaalae	*Schiedea kaalae*
		Schiedea nuttallii
		Schiedea obovata
	Silene perlmanii	*Silene perlmanii*
		Solanum sandwicense
		Stenogyne kanehoana
		Tetramolopium lepidotum ssp. *lepidotum*
	Urera kaalae	*Urera kaalae*
		Viola chamissoniana ssp. *chamissoniana*
Oahu—Lowland Mesic—Unit 4		
		Alectryon macrococcus
		Bonamia menziesii
		Chamaesyce celastroides var. *kaenana*
		Ctenitis squamigera
		Cyanea acuminata
		Cyanea calycina
		Cyanea crispa
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea lanceolata
		Cyanea longiflora
		Cyanea truncata
		Cyrtandra dentata
		Cyrtandra polyantha
		Cyrtandra waiolani
		Delissea subcordata
		Diellia erecta
		Diellia falcata
		Eugenia koolauensis
		Gardenia mannii
		Hesperomannia arborescens
		Isodendrion laurifolium
		Isodendrion longifolium
		Kadua coriacea
		Labordia cyrtandrae
		Lobelia monostachya
		Melicope lydgatei
		Melicope saint-johnii
		Phyllostegia hirsuta
		Phyllostegia mollis
		Phyllostegia parviflora var. *parviflora*
		Plantago princeps var. *princeps*
		Pleomele forbesii
		Pteralyxia macrocarpa
		Schiedea kaalae
		Schiedea nuttallii
		Solanum sandwicense
		Tetraplasandra gymnocarpa
		Tetraplasandra lydgatei
Oahu—Lowland Mesic—Unit 5		
		Alectryon macrococcus
		Bonamia menziesii
		Chamaesyce celastroides var. *kaenana*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Ctenitis squamigera
		Cyanea acuminata
		Cyanea calycina
		Cyanea crispa
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea lanceolata
		Cyanea longiflora
		Cyanea truncata
		Cyrtandra dentata
		Cyrtandra polyantha
		Cyrtandra waiolani
		Delissea subcordata
		Diellia erecta
		Diellia falcata
		Eugenia koolauensis
		Gardenia mannii
		Hesperomannia arborescens
		Isodendrion laurifolium
		Isodendrion longifolium
		Kadua coriacea
		Labordia cyrtandrae
		Lobelia monostachya
		Melicope lydgatei
		Melicope saint-johnii
		Phyllostegia hirsuta
		Phyllostegia mollis
		Phyllostegia parviflora var. *parviflora*
		Plantago princeps var. *princeps*
		Pleomele forbesii
		Pteralyxia macrocarpa
		Schiedea kaalae
		Schiedea nuttallii
		Solanum sandwicense
		Tetraplasandra gymnocarpa
		Tetraplasandra lydgatei
Oahu—Lowland Mesic—Unit 6		
		Alectryon macrococcus
		Bonamia menziesii
		Chamaesyce celastroides var. *kaenana*
		Ctenitis squamigera
	Cyanea acuminata	*Cyanea acuminata*
		Cyanea calycina
	Cyanea crispa	*Cyanea crispa*
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea lanceolata
		Cyanea longiflora
	Cyanea truncata	*Cyanea truncata*
		Cyrtandra dentata
		Cyrtandra polyantha
		Cyrtandra waiolani
		Delissea subcordata
		Diellia erecta
		Diellia falcata
		Eugenia koolauensis
	Gardenia mannii	*Gardenia mannii*
		Hesperomannia arborescens
		Isodendrion laurifolium
		Isodendrion longifolium
		Kadua coriacea
		Labordia cyrtandrae
		Lobelia monostachya
		Melicope lydgatei
		Melicope saint-johnii
		Phyllostegia hirsuta
		Phyllostegia mollis
		Phyllostegia parviflora var. *parviflora*
		Plantago princeps var. *princeps*
		Pleomele forbesii
	Pteralyxia macrocarpa	*Pteralyxia macrocarpa*
	Schiedea kaalae	*Schiedea kaalae*
		Schiedea nuttallii
		Solanum sandwicense

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Tetraplasandra gymnocarpa
		Tetraplasandra lydgatei
Oahu—Lowland Mesic—Unit 7		
		Alectryon macrococcus
	Bonamia menziesii	*Bonamia menziesii*
		Chamaesyce celastroides var. *kaenana*
		Ctenitis squamigera
	Cyanea acuminata	*Cyanea acuminata*
		Cyanea calycina
		Cyanea crispa
	Cyanea grimesiana ssp. *grimesiana*	*Cyanea grimesiana* ssp. *grimesiana*
	Cyanea lanceolata	*Cyanea lanceolata*
		Cyanea longiflora
		Cyanea truncata
		Cyrtandra dentata
	Cyrtandra polyantha	*Cyrtandra polyantha*
		Cyrtandra waiolani
		Delissea subcordata
	Diellia erecta	*Diellia erecta*
		Diellia falcata
		Eugenia koolauensis
		Gardenia mannii
		Hesperomannia arborescens
		Isodendrion laurifolium
		Isodendrion longifolium
		Kadua coriacea
		Labordia cyrtandrae
	Lobelia monostachya	*Lobelia monostachya*
		Melicope lydgatei
		Melicope saint-johnii
		Phyllostegia hirsuta
		Phyllostegia mollis
		Phyllostegia parviflora var. *parviflora*
		Plantago princeps var. *princeps*
	Pleomele forbesii	*Pleomele forbesii*
	Pteralyxia macrocarpa	*Pteralyxia macrocarpa*
		Schiedea kaalae
		Schiedea nuttallii
		Solanum sandwicense
		Tetraplasandra gymnocarpa
	Tetraplasandra lydgatei	*Tetraplasandra lydgatei*
Oahu—Lowland Wet—Unit 1		
		Cyanea acuminata
		Cyanea calycina
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea grimesiana ssp. *obatae*
		Cyrtandra dentata
		Diplazium molokaiense
		Gardenia mannii
	Gouania vitifolia	*Gouania vitifolia*
		Hesperomannia arbuscula
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia oahuensis
	Melicope makahae	*Melicope makahae*
		Phyllostegia hirsuta
		Phyllostegia mollis
		Plantago princeps var. *princeps*
	Pleomele forbesii	*Pleomele forbesii*
		Pteralyxia macrocarpa
	Schiedea hookeri	*Schiedea hookeri*
		Schiedea kaalae
	Urera kaalae	*Urera kaalae*
Oahu—Lowland Wet—Unit 2		
		Cyanea acuminata
		Cyanea calycina
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea grimesiana ssp. *obatae*
		Cyrtandra dentata
		Diplazium molokaiense
		Gardenia mannii
		Gouania vitifolia

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Hesperomannia arbuscula
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia oahuensis
		Melicope makahae
	Phyllostegia hirsuta	*Phyllostegia hirsuta*
	Phyllostegia mollis	*Phyllostegia mollis*
		Plantago princeps var. *princeps*
		Pleomele forbesii
		Pteralyxia macrocarpa
		Schiedea hookeri
		Schiedea kaalae
	Urera kaalae	*Urera kaalae*
Oahu—Lowland Wet—Unit 3		
		Cyanea acuminata
		Cyanea calycina
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea grimesiana ssp. *obatae*
		Cyrtandra dentata
		Diplazium molokaiense
		Gardenia mannii
		Gouania vitifolia
		Hesperomannia arbuscula
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia oahuensis
		Melicope makahae
	Phyllostegia hirsuta	*Phyllostegia hirsuta*
	Phyllostegia mollis	*Phyllostegia mollis*
		Plantago princeps var. *princeps*
		Pleomele forbesii
		Pteralyxia macrocarpa
	Schiedea hookeri	*Schiedea hookeri*
		Schiedea kaalae
		Urera kaalae
Oahu—Lowland Wet—Unit 4		
		Cyanea acuminata
		Cyanea calycina
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea grimesiana ssp. *obatae*
		Cyrtandra dentata
		Diplazium molokaiense
		Gardenia mannii
		Gouania vitifolia
		Hesperomannia arbuscula
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia oahuensis
		Melicope makahae
		Phyllostegia hirsuta
	Phyllostegia mollis	*Phyllostegia mollis*
		Plantago princeps var. *princeps*
		Pleomele forbesii
		Pteralyxia macrocarpa
		Schiedea hookeri
		Schiedea kaalae
		Urera kaalae
Oahu—Lowland Wet—Unit 5		
		Cyanea acuminata
	Cyanea calycina	*Cyanea calycina*
		Cyanea grimesiana ssp. *grimesiana*
	Cyanea grimesiana ssp. *obatae*	*Cyanea grimesiana* ssp. *obatae*
		Cyrtandra dentata
		Diplazium molokaiense
		Gardenia mannii
		Gouania vitifolia
	Hesperomannia arbuscula	*Hesperomannia arbuscula*
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia oahuensis
		Melicope makahae
		Phyllostegia hirsuta

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Phyllostegia mollis
		Plantago princeps var. *princeps*
		Pleomele forbesii
		Pteralyxia macrocarpa
		Schiedea hookeri
	Schiedea kaalae	*Schiedea kaalae*
		Urera kaalae
Oahu—Lowland Wet—Unit 6		
		Adenophorus periens
		Chamaesyce rockii
		Cyanea acuminata
		Cyanea calycina
		Cyanea crispa
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea humboldtiana
		Cyanea koolauensis
		Cyanea lanceolata
		Cyanea purpurellifolia
		Cyanea st.-johnii
		Cyanea truncata
		Cyrtandra dentata
		Cyrtandra gracilis
		Cyrtandra kaulantha
		Cyrtandra polyantha
		Cyrtandra sessilis
		Cyrtandra subumbellata
		Cyrtandra viridiflora
		Cyrtandra waiolani
		Gardenia mannii
	Hesperomannia arborescens	*Hesperomannia arborescens*
		Huperzia nutans
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia gaudichaudii ssp. *koolauensis*
		Lobelia oahuensis
		Melicope hiiakae
		Melicope lydgatei
		Myrsine juddii
		Phyllostegia hirsuta
		Phyllostegia parviflora var. *parviflora*
		Plantago princeps var. *longibracteata*
		Plantago princeps var. *princeps*
		Platanthera holochila
		Platydesma cornuta var. *cornuta*
		Psychotria hexandra ssp. *oahuensis*
		Pteralyxia macrocarpa
		Pteris lidgatei
		Sanicula purpurea
		Tetraplasandra gymnocarpa
		Trematolobelia singularis
		Viola oahuensis
		Zanthoxylum oahuense
Oahu—Lowland Wet—Unit 7		
		Adenophorus periens
	Chamaesyce rockii	*Chamaesyce rockii*
	Cyanea acuminata	*Cyanea acuminata*
	Cyanea calycina	*Cyanea calycina*
		Cyanea crispa
		Cyanea grimesiana ssp. *grimesiana*
	Cyanea humboldtiana	*Cyanea humboldtiana*
		Cyanea koolauensis
		Cyanea lanceolata
	Cyanea purpurellifolia	*Cyanea purpurellifolia*
		Cyanea st.-johnii
	Cyanea truncata	*Cyanea truncata*
		Cyrtandra dentata
		Cyrtandra gracilis
		Cyrtandra kaulantha
		Cyrtandra polyantha
		Cyrtandra sessilis
		Cyrtandra subumbellata
	Cyrtandra viridiflora	*Cyrtandra viridiflora*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Cyrtandra waiolani
	Gardenia mannii	*Gardenia mannii*
	Hesperomannia arborescens	*Hesperomannia arborescens*
	Huperzia nutans	*Huperzia nutans*
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia gaudichaudii ssp. *koolauensis*
		Lobelia oahuensis
		Melicope hiiakae
		Melicope lydgatei
	Myrsine juddii	*Myrsine juddii*
	Phyllostegia hirsuta	*Phyllostegia hirsuta*
		Phyllostegia parviflora var. *parviflora*
		Plantago princeps var. *longibracteata*
		Plantago princeps var. *princeps*
		Platanthera holochila
	Platydesma cornuta var. *cornuta*	*Platydesma cornuta* var. *cornuta*
		Psychotria hexandra ssp. *oahuensis*
	Pteralyxia macrocarpa	*Pteralyxia macrocarpa*
	Pteris lidgatei	*Pteris lidgatei*
		Sanicula purpurea
	Tetraplasandra gymnocarpa	*Tetraplasandra gymnocarpa*
		Trematolobelia singularis
	Viola oahuensis	*Viola oahuensis*
	Zanthoxylum oahuense	*Zanthoxylum oahuense*
Oahu—Lowland Wet—Unit 8		
		Adenophorus periens
		Chamaesyce rockii
		Cyanea acuminata
		Cyanea calycina
		Cyanea crispa
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea humboldtiana
		Cyanea koolauensis
		Cyanea lanceolata
		Cyanea purpurellifolia
		Cyanea st.-johnii
		Cyanea truncata
		Cyrtandra dentata
		Cyrtandra gracilis
	Cyrtandra kaulantha	*Cyrtandra kaulantha*
		Cyrtandra polyantha
		Cyrtandra sessilis
		Cyrtandra subumbellata
		Cyrtandra viridiflora
		Cyrtandra waiolani
		Gardenia mannii
		Hesperomannia arborescens
		Huperzia nutans
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia gaudichaudii ssp. *koolauensis*
		Lobelia oahuensis
		Melicope hiiakae
		Melicope lydgatei
		Myrsine juddii
		Phyllostegia hirsuta
		Phyllostegia parviflora var. *parviflora*
		Plantago princeps var. *longibracteata*
		Plantago princeps var. *princeps*
		Platanthera holochila
		Platydesma cornuta var. *cornuta*
		Psychotria hexandra ssp. *oahuensis*
		Pteralyxia macrocarpa
		Pteris lidgatei
		Sanicula purpurea
		Tetraplasandra gymnocarpa
		Trematolobelia singularis
		Viola oahuensis
		Zanthoxylum oahuense
Oahu—Lowland Wet—Unit 9		
		Adenophorus periens

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
	Chamaesyce rockii	*Chamaesyce rockii*
		Cyanea acuminata
	Cyanea calycina	*Cyanea calycina*
		Cyanea crispa
		Cyanea grimesiana ssp. *grimesiana*
	Cyanea humboldtiana	*Cyanea humboldtiana*
	Cyanea koolauensis	*Cyanea koolauensis*
		Cyanea lanceolata
		Cyanea purpurellifolia
	Cyanea st.-johnii	*Cyanea st.-johnii*
		Cyanea truncata
		Cyrtandra dentata
		Cyrtandra gracilis
		Cyrtandra kaulantha
		Cyrtandra polyantha
		Cyrtandra sessilis
		Cyrtandra subumbellata
	Cyrtandra viridiflora	*Cyrtandra viridiflora*
		Cyrtandra waiolani
	Gardenia mannii	*Gardenia mannii*
	Hesperomannia arborescens	*Hesperomannia arborescens*
		Huperzia nutans
		Isodendrion longifolium
	Labordia cyrtandrae	*Labordia cyrtandrae*
		Lobelia gaudichaudii ssp. *koolauensis*
	Lobelia oahuensis	*Lobelia oahuensis*
	Melicope hiiakae	*Melicope hiiakae*
	Melicope lydgatei	*Melicope lydgatei*
		Myrsine juddii
	Phyllostegia hirsuta	*Phyllostegia hirsuta*
	Phyllostegia parviflora var. *parviflora*	*Phyllostegia parviflora* var. *parviflora*
		Plantago princeps var. *longibracteata*
	Plantago princeps var. *princeps*	*Plantago princeps* var. *princeps*
		Platanthera holochila
	Platydesma cornuta var. *cornuta*	*Platydesma cornuta* var. *cornuta*
		Psychotria hexandra ssp. *oahuensis*
		Pteralyxia macrocarpa
	Pteris lidgatei	*Pteris lidgatei*
		Sanicula purpurea
	Tetraplasandra gymnocarpa	*Tetraplasandra gymnocarpa*
		Trematolobelia singularis
	Viola oahuensis	*Viola oahuensis*
	Zanthoxylum oahuense	*Zanthoxylum oahuense*
Oahu—Lowland Wet—Unit 10		
		Adenophorus periens
		Chamaesyce rockii
		Cyanea acuminata
		Cyanea calycina
		Cyanea crispa
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea humboldtiana
		Cyanea koolauensis
		Cyanea lanceolata
		Cyanea purpurellifolia
		Cyanea st.-johnii
		Cyanea truncata
		Cyrtandra dentata
		Cyrtandra gracilis
		Cyrtandra kaulantha
		Cyrtandra polyantha
		Cyrtandra sessilis
		Cyrtandra subumbellata
		Cyrtandra viridiflora
		Cyrtandra waiolani
		Gardenia mannii
		Hesperomannia arborescens
		Huperzia nutans
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia gaudichaudii ssp. *koolauensis*
		Lobelia oahuensis
		Melicope hiiakae

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Melicope lydgatei *Myrsine juddii* *Phyllostegia hirsuta* *Phyllostegia parviflora* var. *parviflora* *Plantago princeps* var. *longibracteata* *Plantago princeps* var. *princeps* *Platanthera holochila* *Platydesma cornuta* var. *cornuta* *Psychotria hexandra* ssp. *oahuensis* *Pteralyxia macrocarpa* *Pteris lidgatei* *Sanicula purpurea* *Tetraplasandra gymnocarpa* *Trematolobelia singularis* *Viola oahuensis* *Zanthoxylum oahuense*
Oahu—Lowland Wet—Unit 11		*Adenophorus periens* *Chamaesyce rockii* *Cyanea acuminata* *Cyanea calycina* *Cyanea crispa* *Cyanea grimesiana* ssp. *grimesiana* *Cyanea humboldtiana* *Cyanea koolauensis* *Cyanea lanceolata* *Cyanea purpurellifolia* *Cyanea st.-johnii* *Cyanea truncata* *Cyrtandra dentata* *Cyrtandra gracilis* *Cyrtandra kaulantha* *Cyrtandra polyantha* *Cyrtandra sessilis* *Cyrtandra subumbellata* *Cyrtandra viridiflora* *Cyrtandra waiolani* *Gardenia mannii* *Hesperomannia arborescens* *Huperzia nutans* *Isodendrion longifolium* *Labordia cyrtandrae* *Lobelia gaudichaudii* ssp. *koolauensis* *Lobelia oahuensis* *Melicope hiiakae* *Melicope lydgatei* *Myrsine juddii* *Phyllostegia hirsuta* *Phyllostegia parviflora* var. *parviflora* *Plantago princeps* var. *longibracteata* *Plantago princeps* var. *princeps* *Platanthera holochila* *Platydesma cornuta* var. *cornuta* *Psychotria hexandra* ssp. *oahuensis* *Pteralyxia macrocarpa* *Pteris lidgatei* *Sanicula purpurea* *Tetraplasandra gymnocarpa* *Trematolobelia singularis* *Viola oahuensis* *Zanthoxylum oahuense*
Oahu—Lowland Wet—Unit 12		*Adenophorus periens* *Chamaesyce rockii* *Cyanea acuminata* *Cyanea calycina* *Cyanea crispa* *Cyanea grimesiana* ssp. *grimesiana* *Cyanea humboldtiana* *Cyanea koolauensis* *Cyanea lanceolata* *Cyanea purpurellifolia*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Cyanea st.-johnii *Cyanea truncata* *Cyrtandra dentata* *Cyrtandra gracilis* *Cyrtandra kaulantha* *Cyrtandra polyantha* *Cyrtandra sessilis* *Cyrtandra subumbellata* *Cyrtandra viridiflora* *Cyrtandra waiolani* *Gardenia mannii* *Hesperomannia arborescens* *Huperzia nutans* *Isodendrion longifolium* *Labordia cyrtandrae* *Lobelia gaudichaudii* ssp. *koolauensis* *Lobelia oahuensis* *Melicope hiiakae* *Melicope lydgatei* *Myrsine juddii* *Phyllostegia hirsuta* *Phyllostegia parviflora* var. *parviflora* *Plantago princeps* var. *longibracteata* *Plantago princeps* var. *princeps* *Platanthera holochila* *Platydesma cornuta* var. *cornuta* *Psychotria hexandra* ssp. *oahuensis* *Pteralyxia macrocarpa* *Pteris lidgatei* *Sanicula purpurea* *Tetraplasandra gymnocarpa* *Trematolobelia singularis* *Viola oahuensis* *Zanthoxylum oahuense*
Oahu—Lowland Wet—Unit 13		*Adenophorus periens* *Chamaesyce rockii* *Cyanea acuminata* *Cyanea calycina* *Cyanea crispa* *Cyanea grimesiana* ssp. *grimesiana* *Cyanea humboldtiana* *Cyanea koolauensis* *Cyanea lanceolata* *Cyanea purpurellifolia* *Cyanea st.-johnii* *Cyanea truncata* *Cyrtandra dentata* *Cyrtandra gracilis* *Cyrtandra kaulantha* *Cyrtandra polyantha* *Cyrtandra sessilis* *Cyrtandra subumbellata* *Cyrtandra viridiflora* *Cyrtandra waiolani* *Gardenia mannii* *Hesperomannia arborescens* *Huperzia nutans* *Isodendrion longifolium* *Labordia cyrtandrae* *Lobelia gaudichaudii* ssp. *koolauensis* *Lobelia oahuensis* *Melicope hiiakae* *Melicope lydgatei* *Myrsine juddii* *Phyllostegia hirsuta* *Phyllostegia parviflora* var. *parviflora* *Plantago princeps* var. *longibracteata* *Plantago princeps* var. *princeps* *Platanthera holochila* *Platydesma cornuta* var. *cornuta* *Psychotria hexandra* ssp. *oahuensis*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Pteralyxia macrocarpa *Pteris lidgatei* *Sanicula purpurea* *Tetraplasandra gymnocarpa* *Trematolobelia singularis* *Viola oahuensis* *Zanthoxylum oahuense*
Oahu—Lowland Wet—Unit 14	*Cyanea koolauensis*	*Adenophorus periens* *Chamaesyce rockii* *Cyanea acuminata* *Cyanea calycina* *Cyanea crispa* *Cyanea grimesiana* ssp. *grimesiana* *Cyanea humboldtiana* *Cyanea koolauensis* *Cyanea lanceolata* *Cyanea purpurellifolia* *Cyanea st.-johnii* *Cyanea truncata* *Cyrtandra dentata* *Cyrtandra gracilis* *Cyrtandra kaulantha* *Cyrtandra polyantha* *Cyrtandra sessilis* *Cyrtandra subumbellata* *Cyrtandra viridiflora* *Cyrtandra waiolani* *Gardenia mannii* *Hesperomannia arborescens* *Huperzia nutans* *Isodendrion longifolium* *Labordia cyrtandrae* *Lobelia gaudichaudii* ssp. *koolauensis* *Lobelia oahuensis* *Melicope hiiakae* *Melicope lydgatei* *Myrsine juddii* *Phyllostegia hirsuta* *Phyllostegia parviflora* var. *parviflora* *Plantago princeps* var. *longibracteata* *Plantago princeps* var. *princeps* *Platanthera holochila* *Platydesma cornuta* var. *cornuta* *Psychotria hexandra* ssp. *oahuensis* *Pteralyxia macrocarpa* *Pteris lidgatei* *Sanicula purpurea* *Tetraplasandra gymnocarpa* *Trematolobelia singularis* *Viola oahuensis* *Zanthoxylum oahuense*
Oahu—Lowland Wet—Unit 15	*Cyanea crispa*	*Adenophorus periens* *Chamaesyce rockii* *Cyanea acuminata* *Cyanea calycina* *Cyanea crispa* *Cyanea grimesiana* ssp. *grimesiana* *Cyanea humboldtiana* *Cyanea koolauensis* *Cyanea lanceolata* *Cyanea purpurellifolia* *Cyanea st.-johnii* *Cyanea truncata* *Cyrtandra dentata* *Cyrtandra gracilis* *Cyrtandra kaulantha* *Cyrtandra polyantha* *Cyrtandra sessilis* *Cyrtandra subumbellata* *Cyrtandra viridiflora*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Cyrtandra waiolani
		Gardenia mannii
		Hesperomannia arborescens
		Huperzia nutans
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia gaudichaudii ssp. *koolauensis*
		Lobelia oahuensis
		Melicope hiiakae
		Melicope lydgatei
		Myrsine juddii
		Phyllostegia hirsuta
		Phyllostegia parviflora var. *parviflora*
		Plantago princeps var. *longibracteata*
		Plantago princeps var. *princeps*
		Platanthera holochila
		Platydesma cornuta var. *cornuta*
		Psychotria hexandra ssp. *oahuensis*
		Pteralyxia macrocarpa
		Pteris lidgatei
		Sanicula purpurea
		Tetraplasandra gymnocarpa
		Trematolobelia singularis
		Viola oahuensis
		Zanthoxylum oahuense
Oahu—Lowland Wet—Unit 16		
		Adenophorus periens
		Chamaesyce rockii
	Cyanea acuminata	*Cyanea acuminata*
	Cyanea calycina	*Cyanea calycina*
	Cyanea crispa	*Cyanea crispa*
	Cyanea grimesiana ssp. grimesiana	*Cyanea grimesiana* ssp. *grimesiana*
	Cyanea humboldtiana	*Cyanea humboldtiana*
	Cyanea koolauensis	*Cyanea koolauensis*
	Cyanea lanceolata	*Cyanea lanceolata*
		Cyanea purpurellifolia
	Cyanea st.-johnii	*Cyanea st.-johnii*
		Cyanea truncata
		Cyrtandra dentata
	Cyrtandra gracilis	*Cyrtandra gracilis*
		Cyrtandra kaulantha
	Cyrtandra polyantha	*Cyrtandra polyantha*
	Cyrtandra sessilis	*Cyrtandra sessilis*
		Cyrtandra subumbellata
		Cyrtandra viridiflora
		Cyrtandra waiolani
	Gardenia mannii	*Gardenia mannii*
	Hesperomannia arborescens	*Hesperomannia arborescens*
		Huperzia nutans
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia gaudichaudii ssp. *koolauensis*
		Lobelia oahuensis
		Melicope hiiakae
		Melicope lydgatei
		Myrsine juddii
		Phyllostegia hirsuta
		Phyllostegia parviflora var. *parviflora*
		Plantago princeps var. *longibracteata*
		Plantago princeps var. *princeps*
		Platanthera holochila
	Platydesma cornuta var. *cornuta*	*Platydesma cornuta* var. *cornuta*
		Psychotria hexandra ssp. *oahuensis*
		Pteralyxia macrocarpa
		Pteris lidgatei
	Sanicula purpurea	*Sanicula purpurea*
	Tetraplasandra gymnocarpa	*Tetraplasandra gymnocarpa*
		Trematolobelia singularis
		Viola oahuensis
		Zanthoxylum oahuense
Oahu—Montane Wet—Unit 1		
		Alectryon macrococcus var. *macrococcus*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
	Cyanea acuminata	*Cyanea acuminata*
	Cyanea calycina	*Cyanea calycina*
	Labordia cyrtandrae	*Labordia cyrtandrae*
		Lobelia oahuensis
	Melicope christophersenii	*Melicope christophersenii*
		Phyllostegia hirsuta
	Schiedea trinervis	*Schiedea trinervis*
Oahu—Dry Cliff—Unit 1		
		Abutilon sandwicense
		Achyranthes splendens var. *rotundata*
	Alectryon macrococcus	*Alectryon macrococcus*
		Bonamia menziesii
	Cenchrus agrimonioides	*Cenchrus agrimonioides*
	Chamaesyce herbstii	*Chamaesyce herbstii*
		Chamaesyce kuwaleana
	Cyanea grimesiana ssp. *obatae*	*Cyanea grimesiana* ssp. *obatae*
	Cyrtandra dentata	*Cyrtandra dentata*
		Diellia falcata
		Diellia unisora
		Dubautia herbstobatae
		Eragrostis fosbergii
		Flueggea neowawraea
		Gouania meyenii
		Gouania vitifolia
		Isodendrion laurifolium
		Isodendrion pyrifolium
	Kadua degeneri	*Kadua degeneri*
		Kadua parvula
		Korthalsella degeneri
		Lepidium arbuscula
		Lipochaeta lobata var. *leptophylla*
		Lobelia niihauensis
		Melanthera tenuifolia
		Melicope makahae
		Melicope saint-johnii
		Neraudia angulata
		Nototrichium humile
		Peucedanum sandwicense
		Phyllostegia kaalaensis
	Plantago princeps var. *princeps*	*Plantago princeps* var. *princeps*
		Platydesma cornuta var. *decurrens*
		Pleomele forbesii
		Pteralyxia macrocarpa
		Sanicula mariversa
		Schiedea hookeri
	Schiedea obovata	*Schiedea obovata*
		Schiedea trinervis
		Silene lanceolata
		Silene perlmanii
		Spermolepis hawaiiensis
		Tetramolopium filiforme
		Tetramolopium lepidotum ssp. *lepidotum*
		Viola chamissoniana ssp. *chamissoniana*
Oahu—Dry Cliff—Unit 2		
	Abutilon sandwicense	*Abutilon sandwicense*
		Achyranthes splendens var. *rotundata*
	Alectryon macrococcus	*Alectryon macrococcus*
		Bonamia menziesii
		Cenchrus agrimonioides
		Chamaesyce herbstii
		Chamaesyce kuwaleana
		Cyanea grimesiana ssp. *obatae*
		Cyrtandra dentata
		Diellia falcata
		Diellia unisora
	Dubautia herbstobatae	*Dubautia herbstobatae*
		Eragrostis fosbergii
		Flueggea neowawraea
		Gouania meyenii
	Gouania vitifolia	*Gouania vitifolia*
		Isodendrion laurifolium
		Isodendrion pyrifolium

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Kadua degeneri
	Kadua parvula	*Kadua parvula*
		Korthalsella degeneri
	Lepidium arbuscula	*Lepidium arbuscula*
		Lipochaeta lobata var. *leptophylla*
	Lobelia niihauensis	*Lobelia niihauensis*
	Melanthera tenuifolia	*Melanthera tenuifolia*
	Melicope makahae	*Melicope makahae*
		Melicope saint-johnii
		Neraudia angulata
	Nototrichium humile	*Nototrichium humile*
	Peucedanum sandwicense	*Peucedanum sandwicense*
		Phyllostegia kaalaensis
		Plantago princeps var. *princeps*
	Platydesma cornuta var. *decurrens*	*Platydesma cornuta* var. *decurrens*
	Pleomele forbesii	*Pleomele forbesii*
		Pteralyxia macrocarpa
	Sanicula mariversa	*Sanicula mariversa*
	Schiedea hookeri	*Schiedea hookeri*
		Schiedea obovata
		Schiedea trinervis
		Silene lanceolata
		Silene perlmanii
		Spermolepis hawaiiensis
	Tetramolopium filiforme	*Tetramolopium filiforme*
		Tetramolopium lepidotum ssp. *lepidotum*
	Viola chamissoniana ssp. *chamissoniana*	*Viola chamissoniana* ssp. *chamissoniana*
Oahu—Dry Cliff—Unit 3		
	Abutilon sandwicense	*Abutilon sandwicense*
		Achyranthes splendens var. *rotundata*
	Alectryon macrococcus	*Alectryon macrococcus*
	Bonamia menziesii	*Bonamia menziesii*
		Cenchrus agrimonioides
		Chamaesyce herbstii
		Chamaesyce kuwaleana
		Cyanea grimesiana ssp. *obatae*
		Cyrtandra dentata
	Diellia falcata	*Diellia falcata*
		Diellia unisora
	Dubautia herbstobatae	*Dubautia herbstobatae*
	Eragrostis fosbergii	*Eragrostis fosbergii*
	Flueggea neowawraea	*Flueggea neowawraea*
	Gouania meyenii	*Gouania meyenii*
		Gouania vitifolia
	Isodendrion laurifolium	*Isodendrion laurifolium*
		Isodendrion pyrifolium
		Kadua degeneri
		Kadua parvula
	Korthalsella degeneri	*Korthalsella degeneri*
	Lepidium arbuscula	*Lepidium arbuscula*
	Lipochaeta lobata var. *leptophylla*	*Lipochaeta lobata* var. *leptophylla*
	Lobelia niihauensis	*Lobelia niihauensis*
	Melanthera tenuifolia	*Melanthera tenuifolia*
	Melicope makahae	*Melicope makahae*
		Melicope saint-johnii
	Neraudia angulata	*Neraudia angulata*
	Nototrichium humile	*Nototrichium humile*
	Peucedanum sandwicense	*Peucedanum sandwicense*
	Phyllostegia kaalaensis	*Phyllostegia kaalaensis*
		Plantago princeps var. *princeps*
		Platydesma cornuta var. *decurrens*
	Pleomele forbesii	*Pleomele forbesii*
	Pteralyxia macrocarpa	*Pteralyxia macrocarpa*
		Sanicula mariversa
	Schiedea hookeri	*Schiedea hookeri*
		Schiedea obovata
		Schiedea trinervis
	Silene lanceolata	*Silene lanceolata*
		Silene perlmanii
		Spermolepis hawaiiensis
	Tetramolopium filiforme	*Tetramolopium filiforme*
		Tetramolopium lepidotum ssp. lepidotum

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
Oahu—Dry Cliff—Unit 4	*Viola chamissoniana* ssp. *chamissoniana*	*Viola chamissoniana* ssp. *chamissoniana*
		Abutilon sandwicense
		Achyranthes splendens var. *rotundata*
	Alectryon macrococcus	*Alectryon macrococcus*
		Bonamia menziesii
		Cenchrus agrimonioides
		Chamaesyce herbstii
	Chamaesyce kuwaleana	*Chamaesyce kuwaleana*
		Cyanea grimesiana ssp. *obatae*
		Cyrtandra dentata
		Diellia falcata
		Diellia unisora
		Dubautia herbstobatae
		Eragrostis fosbergii
		Flueggea neowawraea
		Gouania meyenii
		Gouania vitifolia
		Isodendrion laurifolium
		Isodendrion pyrifolium
		Kadua degeneri
		Kadua parvula
		Korthalsella degeneri
		Lepidium arbuscula
		Lipochaeta lobata var. *leptophylla*
		Lobelia niihauensis
		Melanthera tenuifolia
		Melicope makahae
		Melicope saint-johnii
		Neraudia angulata
		Nototrichium humile
		Peucedanum sandwicense
		Phyllostegia kaalaensis
		Plantago princeps var. *princeps*
		Platydesma cornuta var. *decurrens*
		Pleomele forbesii
		Pteralyxia macrocarpa
		Sanicula mariversa
		Schiedea hookeri
		Schiedea obovata
		Schiedea trinervis
		Silene lanceolata
		Silene perlmanii
	Spermolepis hawaiiensis	*Spermolepis hawaiiensis*
		Tetramolopium filiforme
		Tetramolopium lepidotum ssp. *lepidotum*
		Viola chamissoniana ssp. *chamissoniana*
Oahu—Dry Cliff—Unit 5		
		Abutilon sandwicense
		Achyranthes splendens var. *rotundata*
	Alectryon macrococcus	*Alectryon macrococcus*
	Bonamia menziesii	*Bonamia menziesii*
		Cenchrus agrimonioides
		Chamaesyce herbstii
		Chamaesyce kuwaleana
		Cyanea grimesiana ssp. *obatae*
		Cyrtandra dentata
		Diellia falcata
		Diellia unisora
		Dubautia herbstobatae
		Eragrostis fosbergii
	Flueggea neowawraea	*Flueggea neowawraea*
		Gouania meyenii
		Gouania vitifolia
		Isodendrion laurifolium
		Isodendrion pyrifolium
		Kadua degeneri
		Kadua parvula
		Korthalsella degeneri
		Lepidium arbuscula
	Lipochaeta lobata var. *leptophylla*	*Lipochaeta lobata* var. *leptophylla*
	Lobelia niihauensis	*Lobelia niihauensis*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Melanthera tenuifolia
		Melicope makahae
		Melicope saint-johnii
		Neraudia angulata
	Nototrichium humile	*Nototrichium humile*
		Peucedanum sandwicense
		Phyllostegia kaalaensis
		Plantago princeps var. *princeps*
	Platydesma cornuta var. *decurrens*	*Platydesma cornuta* var. *decurrens*
	Pleomele forbesii	*Pleomele forbesii*
		Pteralyxia macrocarpa
		Sanicula mariversa
	Schiedea hookeri	*Schiedea hookeri*
		Schiedea obovata
		Schiedea trinervis
		Silene lanceolata
		Silene perlmanii
		Spermolepis hawaiiensis
		Tetramolopium filiforme
		Tetramolopium lepidotum ssp. *lepidotum*
		Viola chamissoniana ssp. *chamissoniana*
Oahu—Dry Cliff—Unit 6		
		Abutilon sandwicense
		Achyranthes splendens var. *rotundata*
		Alectryon macrococcus
		Bonamia menziesii
	Cenchrus agrimonioides	*Cenchrus agrimonioides*
		Chamaesyce herbstii
		Chamaesyce kuwaleana
		Cyanea grimesiana ssp. *obatae*
		Cyrtandra dentata
		Diellia falcata
	Diellia unisora	*Diellia unisora*
		Dubautia herbstobatae
		Eragrostis fosbergii
	Flueggea neowawraea	*Flueggea neowawraea*
		Gouania meyenii
		Gouania vitifolia
		Isodendrion laurifolium
		Isodendrion pyrifolium
		Kadua degeneri
		Kadua parvula
		Korthalsella degeneri
	Lepidium arbuscula	*Lepidium arbuscula*
		Lipochaeta lobata var. *leptophylla*
	Lobelia niihauensis	*Lobelia niihauensis*
		Melanthera tenuifolia
		Melicope makahae
	Melicope saint-johnii	*Melicope saint-johnii*
	Neraudia angulata	*Neraudia angulata*
		Nototrichium humile
		Peucedanum sandwicense
		Phyllostegia kaalaensis
	Plantago princeps var. *princeps*	*Plantago princeps* var. *princeps*
		Platydesma cornuta var. *decurrens*
	Pleomele forbesii	*Pleomele forbesii*
	Pteralyxia macrocarpa	*Pteralyxia macrocarpa*
		Sanicula mariversa
		Schiedea hookeri
		Schiedea obovata
		Schiedea trinervis
		Silene lanceolata
		Silene perlmanii
		Spermolepis hawaiiensis
		Tetramolopium filiforme
	Tetramolopium lepidotum ssp. *lepidotum*	*Tetramolopium lepidotum* ssp. *lepidotum*
		Viola chamissoniana ssp. *chamissoniana*
Oahu—Dry Cliff—Unit 7		
	Abutilon sandwicense	*Abutilon sandwicense*
	Achyranthes splendens var. *rotundata*	*Achyranthes splendens* var. *rotundata*
		Alectryon macrococcus
		Bonamia menziesii

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Cenchrus agrimonioides
		Chamaesyce herbstii
		Chamaesyce kuwaleana
		Cyanea grimesiana ssp. *obatae*
		Cyrtandra dentata
		Diellia falcata
	Diellia unisora	*Diellia unisora*
		Dubautia herbstobatae
		Eragrostis fosbergii
	Flueggea neowawraea	*Flueggea neowawraea*
		Gouania meyenii
		Gouania vitifolia
		Isodendrion laurifolium
		Isodendrion pyrifolium
		Kadua degeneri
	Kadua parvula	*Kadua parvula*
		Korthalsella degeneri
	Lepidium arbuscula	*Lepidium arbuscula*
		Lipochaeta lobata var. *leptophylla*
		Lobelia niihauensis
		Melanthera tenuifolia
		Melicope makahae
	Melicope saint-johnii	*Melicope saint-johnii*
	Neraudia angulata	*Neraudia angulata*
		Nototrichium humile
		Peucedanum sandwicense
		Phyllostegia kaalaensis
	Plantago princeps var. *princeps*	*Plantago princeps* var. *princeps*
	Platydesma cornuta var. *decurrens*	*Platydesma cornuta* var. *decurrens*
	Pleomele forbesii	*Pleomele forbesii*
		Pteralyxia macrocarpa
		Sanicula mariversa
		Schiedea hookeri
		Schiedea obovata
		Schiedea trinervis
		Silene lanceolata
	Silene perlmanii	*Silene perlmanii*
		Spermolepis hawaiiensis
		Tetramolopium filiforme
		Tetramolopium lepidotum ssp. *lepidotum*
	Viola chamissoniana ssp. *chamissoniana*	*Viola chamissoniana* ssp. *chamissoniana*
Oahu—Dry Cliff—Unit 8		
	Abutilon sandwicense	*Abutilon sandwicense*
		Achyranthes splendens var. *rotundata*
		Alectryon macrococcus
	Bonamia menziesii	*Bonamia menziesii*
		Cenchrus agrimonioides
		Chamaesyce herbstii
		Chamaesyce kuwaleana
		Cyanea grimesiana ssp. *obatae*
		Cyrtandra dentata
		Diellia falcata
		Diellia unisora
		Dubautia herbstobatae
		Eragrostis fosbergii
	Flueggea neowawraea	*Flueggea neowawraea*
		Gouania meyenii
		Gouania vitifolia
		Isodendrion laurifolium
		Isodendrion pyrifolium
		Kadua degeneri
		Kadua parvula
		Korthalsella degeneri
		Lepidium arbuscula
		Lipochaeta lobata var. *leptophylla*
	Lobelia niihauensis	*Lobelia niihauensis*
		Melanthera tenuifolia
		Melicope makahae
		Melicope saint-johnii
	Neraudia angulata	*Neraudia angulata*
	Nototrichium humile	*Nototrichium humile*
		Peucedanum sandwicense

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Phyllostegia kaalaensis
		Plantago princeps var. *princeps*
		Platydesma cornuta var. *decurrens*
	Pleomele forbesii	*Pleomele forbesii*
		Pteralyxia macrocarpa
		Sanicula mariversa
		Schiedea hookeri
		Schiedea obovata
		Schiedea trinervis
		Silene lanceolata
		Silene perlmanii
		Spermolepis hawaiiensis
		Tetramolopium filiforme
		Tetramolopium lepidotum ssp. *lepidotum*
		Viola chamissoniana ssp. *chamissoniana*
Oahu—Wet Cliff—Unit 1		
		Cyanea acuminata
	Cyanea calycina	*Cyanea calycina*
		Labordia cyrtandrae
		Lobelia oahuensis
	Melicope christophersenii	*Melicope christophersenii*
		Phyllostegia hirsuta
		Pteralyxia macrocarpa
		Schiedea hookeri
		Schiedea kaalae
	Schiedea trinervis	*Schiedea trinervis*
Oahu—Wet Cliff—Unit 2		
		Cyanea acuminata
	Cyanea calycina	*Cyanea calycina*
		Labordia cyrtandrae
		Lobelia oahuensis
	Melicope christophersenii	*Melicope christophersenii*
		Phyllostegia hirsuta
		Pteralyxia macrocarpa
		Schiedea hookeri
		Schiedea kaalae
		Schiedea trinervis
Oahu—Wet Cliff—Unit 3		
		Cyanea acuminata
		Cyanea calycina
		Labordia cyrtandrae
		Lobelia oahuensis
		Melicope christophersenii
		Phyllostegia hirsuta
		Pteralyxia macrocarpa
		Schiedea hookeri
		Schiedea kaalae
		Schiedea trinervis
Oahu—Wet Cliff—Unit 4		
		Cyanea acuminata
		Cyanea calycina
		Labordia cyrtandrae
		Lobelia oahuensis
		Melicope christophersenii
	Phyllostegia hirsuta	*Phyllostegia hirsuta*
		Pteralyxia macrocarpa
	Schiedea hookeri	*Schiedea hookeri*
		Schiedea kaalae
		Schiedea trinervis
Oahu—Wet Cliff—Unit 5		
		Cyanea acuminata
		Cyanea calycina
		Labordia cyrtandrae
		Lobelia oahuensis
		Melicope christophersenii
		Phyllostegia hirsuta
		Pteralyxia macrocarpa
		Schiedea hookeri
		Schiedea kaalae
		Schiedea trinervis
Oahu—Wet Cliff—Unit 6		
		Adenophorus periens

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Chamaesyce deppeana
		Chamaesyce rockii
		Cyanea acuminata
		Cyanea calycina
	Cyanea crispa	*Cyanea crispa*
		Cyanea humboldtiana
		Cyanea purpurellifolia
		Cyanea st.-johnii
		Cyanea truncata
		Cyrtandra kaulantha
		Cyrtandra sessilis
		Cyrtandra subumbellata
		Cyrtandra viridiflora
	Huperzia nutans	*Huperzia nutans*
		Labordia cyrtandrae
		Lobelia oahuensis
		Lysimachia filifolia
		Phyllostegia hirsuta
		Phyllostegia parviflora var. *parviflora*
		Plantago princeps var. *princeps*
		Psychotria hexandra ssp. *oahuensis*
	Pteralyxia macrocarpa	*Pteralyxia macrocarpa*
		Sanicula purpurea
	Schiedea kaalae	*Schiedea kaalae*
		Tetraplasandra gymnocarpa
		Trematolobelia singularis
		Viola oahuensis
Oahu—Wet Cliff—Unit 7		
		Adenophorus periens
		Chamaesyce deppeana
		Chamaesyce rockii
		Cyanea acuminata
		Cyanea calycina
	Cyanea crispa	*Cyanea crispa*
		Cyanea humboldtiana
		Cyanea purpurellifolia
		Cyanea st.-johnii
		Cyanea truncata
		Cyrtandra kaulantha
		Cyrtandra sessilis
		Cyrtandra subumbellata
		Cyrtandra viridiflora
		Huperzia nutans
		Labordia cyrtandrae
		Lobelia oahuensis
		Lysimachia filifolia
		Phyllostegia hirsuta
		Phyllostegia parviflora var. *parviflora*
		Plantago princeps var. *princeps*
	Psychotria hexandra ssp. *oahuensis*	*Psychotria hexandra* ssp. *oahuensis*
		Pteralyxia macrocarpa
		Sanicula purpurea
	Schiedea kaalae	*Schiedea kaalae*
		Tetraplasandra gymnocarpa
		Trematolobelia singularis
		Viola oahuensis
Oahu—Wet Cliff—Unit 8		
		Adenophorus periens
		Chamaesyce deppeana
		Chamaesyce rockii
	Cyanea acuminata	*Cyanea acuminata*
	Cyanea calycina	*Cyanea calycina*
		Cyanea crispa
	Cyanea humboldtiana	*Cyanea humboldtiana*
	Cyanea purpurellifolia	*Cyanea purpurellifolia*
	Cyanea st.-johnii	*Cyanea st.-johnii*
		Cyanea truncata
	Cyrtandra kaulantha	*Cyrtandra kaulantha*
	Cyrtandra sessilis	*Cyrtandra sessilis*
	Cyrtandra subumbellata	*Cyrtandra subumbellata*
	Cyrtandra viridiflora	*Cyrtandra viridiflora*
	Huperzia nutans	*Huperzia nutans*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
	Labordia cyrtandrae	*Labordia cyrtandrae*
	Lobelia oahuensis	*Lobelia oahuensis*
	Lysimachia filifolia	*Lysimachia filifolia*
	Phyllostegia hirsuta	*Phyllostegia hirsuta*
	Phyllostegia parviflora var. *parviflora*	*Phyllostegia parviflora* var. *parviflora*
	Plantago princeps var. *princeps*	*Plantago princeps* var. *princeps*
		Psychotria hexandra ssp. *oahuensis*
	Pteralyxia macrocarpa	*Pteralyxia macrocarpa*
	Sanicula purpurea	*Sanicula purpurea*
		Schiedea kaalae
	Tetraplasandra gymnocarpa	*Tetraplasandra gymnocarpa*
	Trematolobelia singularis	*Trematolobelia singularis*
	Viola oahuensis	*Viola oahuensis*

(j) *Plants on Oahu; Constituent elements.*

(1) *Flowering plants.*

FAMILY AMARANTHACEAE:

Achyranthes splendens var. *rotundata* (round-leaved chaff flower)

Oahu—Coastal—Unit 1, Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, Oahu—Coastal—Unit 15, Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Achyranthes splendens* var. *rotundata* on Oahu.

(i) In units Oahu—Coastal—Unit 1, Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, and Oahu—Coastal—Unit 15, 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 Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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 units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Nototrichium humile (KULUI)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Nototrichium humile* on Oahu.

(i) In units Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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 Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7,

and Oahu—Dry Cliff—Unit 8, 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 APIACEAE:

Peucedanum sandwicense (MAKOU)

Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Peucedanum sandwicense* on Oahu. Within these units, 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*.

Sanicula mariversa (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Sanicula mariversa* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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*.

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Sanicula purpurea (NCN)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Sanicula purpurea* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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*, *Leptecophylla*, *Metrosideros*.

(F) Understory: *Ferns*, *Bryophytes*, *Coprosma*, *Dubautia*, *Kadua*, *Peperomia*.

Spermolepis hawaiiensis (NCN)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 6, Oahu—Lowland Dry—Unit 7, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Spermolepis hawaiiensis* on Oahu.

(i) In units Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 6, Oahu—Lowland Dry—Unit 7, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, the physical or 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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 APOCYNACEAE:

Pteralyxia macrocarpa (KAULU)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, Oahu—Dry Cliff—Unit 8, Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Pteralyxia macrocarpa* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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 Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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*, *Leptecophylla*, *Metrosideros*.

(F) Understory: Ferns, Bryophytes, *Coprosma*, *Dubautia*, *Kadua*, *Peperomia*.

FAMILY ARALIACEAE:

Tetraplasandra gymnocarpa (OHE OHE)

Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Tetraplasandra gymnocarpa* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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*, *Leptecophylla*, *Metrosideros*.

(F) Understory: Ferns, Bryophytes, *Coprosma*, *Dubautia*, *Kadua*, *Peperomia*.

Tetraplasandra lydgatei (NCN)

Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Tetraplasandra lydgatei* on Oahu. Within these units, 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 ASPARAGACEAE:

Pleomele forbesii (HALA PEPE)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Pleomele forbesii* on Oahu.

(i) In units Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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 Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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 ASTERACEAE:

Bidens amplectens (KOOKOOLAU)

Oahu—Coastal—Unit 1, Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, Oahu—Coastal—Unit 15, Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, and Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Bidens amplectens* on Oahu.

(i) In units Oahu—Coastal—Unit 1, Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, and Oahu—Coastal—Unit 15, 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 Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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.*

Dubautia herbstobatae (NAENAE)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2,

Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Dubautia herbstobatae* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Hesperomannia arborescens* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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.*

Hesperomannia arbuscula (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Hesperomannia arbuscula* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, 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.*

Lipochaeta lobata var. *leptophylla* (NEHE)

Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Lipochaeta lobata* var. *leptophylla* on Oahu. Within these units, 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.*

Melanthera tenuifolia (NEHE)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—

Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Melanthera tenuifolia* on Oahu.

(i) In units Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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).xxx

(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 Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Tetramolopium filiforme (NCN)

Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, Identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Tetramolopium filiforme* on Oahu. Within these units, 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.*

Tetramolopium lepidotum ssp. *lepidotum* (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Tetramolopium lepidotum* ssp. *lepidotum* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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 BRASSICACEAE:

Lepidium arbuscula (ANAUNAU)

Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Lepidium arbuscula* on Oahu. Within these units, 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.*

FAMILY CAMPANULACEAE:

Cyanea acuminata (HAHA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Montane Wet—Unit 1, Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea acuminata* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,600 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 Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Ferns, Bryophytes, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea calycina (HAHA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Montane Wet—Unit 1, Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea calycina* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,600 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 Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea crispa (NCN)

Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—

Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea crispa* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea grimesiana ssp. *grimesiana* (HAHA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea grimesiana* ssp. *grimesiana* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 grimesiana ssp. *obatae* (HAHA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea grimesiana* ssp. *obatae* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Cyanea humboldtiana (HAHA)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea humboldtiana* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea koolauensis (HAHA)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea koolauensis* on Oahu. Within these units, 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.*

Cyanea lanceolata (HAHA)

Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea lanceolata* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 longiflora (HAHA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea longiflora* on Oahu. Within these units, 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.*

Cyanea pinnatifida (HAHA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea pinnatifida*

on Oahu. Within these units, 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.*

Cyanea purpurellifolia (HAHA)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea purpurellifolia* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, the physical or 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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea st.-johnii (HAHA)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea st.-johnii* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea superba (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea superba* on Oahu. Within these units, 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.*

Cyanea truncata (HAHA)

Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyanea truncata* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—

Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Delissea subcordata (OHA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Delissea subcordata* on Oahu. Within these units, 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.*

Lobelia gaudichaudii ssp. *koolauensis* (NCN)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Lobelia gaudichaudii* ssp. *koolauensis* on Oahu. Within these units, 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.*

Lobelia monostachya (NCN)

Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Lobelia monostachya* on Oahu. Within these units, 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.*

Lobelia niihauensis (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Lobelia niihauensis* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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, Psydrax, Pleomele.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Lobelia oahuensis (NCN)

Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Montane Wet—Unit 1, Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Lobelia oahuensis* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—

Lowland Wet—Unit 16, 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 Oahu—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,600 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 Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Trematolobelia singularis (NCN)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Trematolobelia singularis* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, the physical or 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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

FAMILY CARYOPHYLLACEAE:

Schiedea hookeri (NCN)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, Oahu—Dry Cliff—Unit 8, Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, and Oahu—Wet Cliff—Unit 5, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Schiedea hookeri* on Oahu.

(i) In units Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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 Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7,

and Oahu—Dry Cliff—Unit 8, 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 Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, and Oahu—Wet Cliff—Unit 5, 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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Schiedea kaalae (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Schiedea kaalae* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, 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 Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Schiedea kealiae (MAOLIOLI)

Oahu—Coastal—Unit 1, Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, Oahu—Coastal—Unit 15, Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Schiedea kealiae* on Oahu.

(i) In unit Oahu—Coastal—Unit 1, Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, and Oahu—Coastal—Unit 15, 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 Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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.*

Schiedea nuttallii (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Schiedea nuttallii* on Oahu. Within these units, 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 obovata (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry

Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Schiedea obovata* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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 trinervis (NCN)

Oahu—Montane Wet—Unit 1, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, Oahu—Dry Cliff—Unit 8, Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, and Oahu—Wet Cliff—Unit 5, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Schiedea trinervis* on Oahu.

(i) In unit Oahu—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,600 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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 Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, and Oahu—Wet Cliff—Unit 5, 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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Silene lanceolata (NCN)

Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Silene lanceolata* on Oahu. Within these units, 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.*

Silene perlmanii (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Silene perlmanii* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, the physical or 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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 CONVOLVULACEAE:

Bonamia menziesii (NCN)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—

Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Bonamia menziesii* on Oahu.

(i) In units Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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 Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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 CYPERACEAE:

Cyperus pennatiformis (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyperus pennatiformis* on Oahu. Within these units, 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.*

Cyperus trachysanthos (PUUKAA)

Oahu—Coastal—Unit 9, Oahu—Coastal—Unit 11, Oahu—Coastal—Unit 12, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, and Oahu—Lowland Dry—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyperus trachysanthos* on Oahu.

(i) In units Oahu—Coastal—Unit 9, Oahu—Coastal—Unit 11, and Oahu—Coastal—Unit 12, 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 Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, and Oahu—Lowland Dry—Unit 7, 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 EUPHORBIACEAE:

Chamaesyce celastroides var. *kaenana* (AKOKO)

Oahu—Coastal—Unit 1, Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, Oahu—Coastal—Unit 15, Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Chamaesyce celastroides* var. *kaenana* on Oahu.

(i) In units Oahu—Coastal—Unit 1, Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, and Oahu—Coastal—Unit 15, 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 Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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 units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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.*

Chamaesyce deppeana (AKOKO)

Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Chamaesyce deppeana* on Oahu. Within these units, 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, Leptecophylla, Metrosideros.*

(vi) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Chamaesyce herbstii (AKOKO)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Chamaesyce herbstii* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Chamaesyce kuwaleana (AKOKO)

Oahu—Coastal—Unit 2, Oahu—Coastal—Unit 3, Oahu—Coastal—Unit 4, Oahu—Coastal—Unit 5, Oahu—Coastal—Unit 6, Oahu—Coastal—Unit 7, Oahu—Coastal—Unit 8, Oahu—Coastal—Unit 9, Oahu—Coastal—Unit 10, Oahu—Coastal—Unit 11, Oahu—Coastal—Unit 12, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Chamaesyce kuwaleana* on Oahu.

(i) In units Oahu—Coastal—Unit 2, Oahu—Coastal—Unit 3, Oahu—Coastal—Unit 4, Oahu—Coastal—Unit 5, Oahu—Coastal—Unit 6, Oahu—Coastal—Unit 7, Oahu—Coastal—Unit 8, Oahu—Coastal—Unit 9, Oahu—Coastal—Unit 10, Oahu—Coastal—Unit 11, and Oahu—Coastal—Unit 12, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Chamaesyce rockii (AKOKO)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Chamaesyce rockii* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Chamaesyce skottsbergii var. *skottsbergii* (EWA PLAINS AKOKO)

Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Chamaesyce skottsbergii* var. *skottsbergii* on Oahu. Within these units, 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.*

Euphorbia haeleeleana (AKOKO)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Euphorbia haeleeleana* on Oahu.

(i) In units Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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 Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

Flueggea neowawraea (MEHAMEHAME)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Flueggea neowawraea* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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 FABACEAE:

Sesbania tomentosa (OHAI)

Oahu—Coastal—Unit 1, Oahu—Coastal—Unit 2, Oahu—Coastal—Unit 3, Oahu—Coastal—Unit 4, Oahu—Coastal—Unit 5, Oahu—Coastal—Unit 6, Oahu—Coastal—Unit 7, Oahu—Coastal—Unit 8, Oahu—Coastal—Unit 9, Oahu—Coastal—Unit 10, Oahu—Coastal—Unit 11, Oahu—Coastal—Unit 12, Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, and Oahu—Coastal—Unit 15, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Sesbania tomentosa* on Oahu. Within these units, the physical and biological features of critical habitat are:

(i) Elevation: Less than 980 ft (300 m).

(i) 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.*

Vigna o-wahuensis (NCN)

Oahu—Coastal—Unit 1, Oahu—Coastal—Unit 2, Oahu—Coastal—Unit 3, Oahu—Coastal—Unit 4, Oahu—Coastal—Unit 5, Oahu—Coastal—Unit 6, Oahu—Coastal—Unit 7, Oahu—Coastal—Unit 8, Oahu—Coastal—Unit 9, Oahu—Coastal—Unit 10, Oahu—Coastal—Unit 11, Oahu—Coastal—Unit 12, Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, and Oahu—Coastal—Unit 15, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Vigna o-wahuensis* on Oahu. Within these units, 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 GENTIANACEAE:

Centaurium sebaeoides (AWIWI)

Oahu—Coastal—Unit 1, Oahu—Coastal—Unit 2, Oahu—Coastal—Unit 3, Oahu—Coastal—Unit 4, Oahu—Coastal—Unit 5, Oahu—Coastal—Unit 6, Oahu—Coastal—Unit 7, Oahu—Coastal—Unit 8, Oahu—Coastal—Unit 9, Oahu—Coastal—Unit 10, Oahu—Coastal—Unit 11, Oahu—Coastal—Unit 12, Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, and Oahu—Coastal—Unit 15, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Centaurium sebaeoides* on Oahu. Within these units, 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 dentata (HAIWALE)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyrtandra dentata* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Cyrtandra gracilis (HAIWALE)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyrtandra gracilis* on Oahu. Within these units, 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.*

Cyrtandra kaulantha (HAIWALE)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyrtandra kaulantha* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyrtandra polyantha (HAIWALE)

Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyrtandra polyantha* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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.*

Cyrtandra sessilis (HAIWALE)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyrtandra sessilis* Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyrtandra subumbellata (HAIWALE)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyrtandra subumbellata* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyrtandra viridiflora (HAIWALE)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland

Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyrtandra viridiflora* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyrtandra waiolani (HAIWALE)

Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cyrtandra waiolani* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 hirsuta (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Montane Wet—Unit 1, Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Phyllostegia hirsuta* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,600 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 Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Phyllostegia kaalaensis (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Phyllostegia kaalaensis* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Phyllostegia mollis (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Phyllostegia mollis* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, 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.*

Phyllostegia parviflora (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Phyllostegia parviflora* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, the physical and biological features of critical habitat for *Phyllostegia parviflora* var. *lydgatei* 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 Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, the physical and biological features of critical habitat for *Phyllostegia parviflora* var. *parviflora* 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 Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, the physical and biological features of critical habitat for *Phyllostegia parviflora* var. *parviflora* 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, the physical and biological features of critical habitat for *Phyllostegia parviflora* var. *parviflora* 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.*

Stenogyne kanehoana (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Stenogyne kanehoana* on Oahu. Within these units, 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 LOGANIACEAE:

Labordia cyrtandrae (KAMAKAHALA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Montane Wet—Unit 1, Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Labordia cyrtandrae* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,600 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 Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, Oahu—Wet Cliff—Unit 5, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

FAMILY MALVACEAE:

Abutilon sandwicense (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Abutilon sandwicense* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2,

and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Hibiscus brackenridgei (MAO HAU HELE)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Hibiscus brackenridgei* var. *mokuleianus* and *Hibiscus brackenridgei* var. *molokaiana* on Oahu.

(i) In units Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, the physical and biological features of critical habitat for *Hibiscus brackenridgei* var. *mokuleianus* and *Hibiscus brackenridgei* var. *molokaiana* 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 Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, the physical and biological features of critical habitat for *Hibiscus brackenridgei* var. *mokuleianus* and *Hibiscus brackenridgei* var. *molokaiana* 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 MYRSINACEAE:

Myrsine juddii (KOLEA)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Myrsine juddii* on Oahu. Within these units, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(i) 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 MYRTACEAE:

Eugenia koolauensis (NIOI)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Eugenia koolauensis* on Oahu. Within these units, 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 ORCHIDACEAE:

Platanthera holochila (NCN)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Platanthera holochila* on Oahu. Within these units, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(i) 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 PLANTAGINACEAE:

Plantago princeps (LAUKAHI KUAHIWI)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4,

Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, Oahu—Dry Cliff—Unit 8, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Plantago princeps* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, the physical and biological features of critical habitat for *Plantago princeps* var. *princeps* 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 Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, the physical and biological features of critical habitat for *Plantago princeps* var. *longibracteata* 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, the physical and biological features of critical habitat for *Plantago princeps* var. *princeps* 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, the physical and biological features of critical habitat for *Plantago princeps* var. *princeps* 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, the physical and biological features of critical habitat for *Plantago princeps* var. *princeps* 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.*

FAMILY POACEAE:

Cenchrus agrimonioides (KAMANOMANO)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Cenchrus agrimonioides* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Eragrostis fosbergii (FOSBERG'S LOVE GRASS)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Eragrostis fosbergii* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2,

and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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 PRIMULACEAE

Lysimachia filifolia (NCN)

Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Lysimachia filifolia* on Oahu. Within these units, 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, Leptecophylla, Metrosideros.*

(vi) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

FAMILY RHAMNACEAE:

Colubrina oppositifolia (KAUILA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Colubrina oppositifolia* on Oahu. Within these units, 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.*

Gouania meyenii (NCN)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 6, Oahu—Lowland Dry—Unit 7, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Gouania meyenii* on Oahu.

(i) In units Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 6, Oahu—Lowland Dry—Unit 7, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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 Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Gouania vitifolia (NCN)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Gouania vitifolia* on Oahu.

(i) In units Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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 Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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 RUBIACEAE:

Gardenia mannii (NANU)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Gardenia mannii* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 coriacea (KIOELE)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Kadua coriacea* on Oahu. Within these units, 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.*

Kadua degeneri (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Kadua degeneri* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Kadua parvula (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Kadua parvula* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Psychotria hexandra ssp. *oahuensis* (KOPIKO)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Psychotria hexandra* ssp. *oahuensis* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

FAMILY RUTACEAE:

Melicope christophersenii (ALANI)

Oahu—Montane Wet—Unit 1, Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, and Oahu—Wet Cliff—Unit 5, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Melicope christophersenii* on Oahu.

(i) In unit Oahu—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,600 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 Oahu—Wet Cliff—Unit 1, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, Oahu—Wet Cliff—Unit 4, and Oahu—Wet Cliff—Unit 5, 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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Melicope hiiakae (ALANI)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Melicope hiiakae* on Oahu. Within these units, 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.*

Melicope lydgatei (ALANI)

Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—

Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Melicope lydgatei* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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.*

Melicope makahae (ALANI)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Melicope makahae* on Oahu.

(i) In units Oahu Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Melicope pallida (ALANI)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Melicope pallida* on Oahu. Within these units, 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 saint-johnii (ALANI)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Melicope saint-johnii* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Platydesma cornuta var. *cornuta* (NCN)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Platydesma cornuta* var. *cornuta* on Oahu. Within these units, 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.*

Platydesma cornuta var. *decurrens* (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Platydesma cornuta* var. *decurrens* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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 to190 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Zanthoxylum oahuense (AE)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Zanthoxylum oahuense* on Oahu. Within these units, 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 SAPINDACEAE:

Alectryon macrococcus (MAHOE)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Montane Wet—Unit 1, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Alectryon macrococcus* var. *macrococcus* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,600 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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 SOLANACEAE:

Solanum sandwicense (POPOLO, AIAKEAKUA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Solanum sandwicense* on Oahu. Within these units, 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 URTICACEAE:

Neraudia angulata (NCN)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Neraudia angulata* on Oahu.

(i) In units Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, the physical and biological features of critical habitat for *Neraudia angulata* var. *angulata* and *Neraudia angulata* var. *dentata* 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 Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—Lowland Mesic—Unit 3, the physical and biological features of critical habitat for *Neraudia angulata* var. *angulata* and *Neraudia angulata* var. *dentata* 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, the physical and biological features of critical habitat for *Neraudia angulata* var. *angulata* and *Neraudia angulata* var. *dentata* 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.*

Urera kaalae (OPUHE)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Urera kaalae* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, 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 VIOLACEAE:

Isodendrion laurifolium (AUPAKA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Isodendrion laurifolium* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Isodendrion longifolium (AUPAKA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Isodendrion longifolium* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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.*

Isodendrion pyrifolium (WAHINE NOHO KULA)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, Oahu—Lowland Dry—Unit 11, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Isodendrion pyrifolium* on Oahu.

(i) In units Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Viola chamissoniana ssp. *chamissoniana* (PAMAKANI)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Viola chamissoniana* ssp. *chamissoniana* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Viola oahuensis (NCN)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Viola oahuensis* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

FAMILY VISCACEAE:

Korthalsella degeneri (HULUMOA)

Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Korthalsella degeneri* on Oahu. Within these units, the physical and biological features of critical habitat are:

(i) Elevation: Unrestricted.

(i) 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.*

(2) *Ferns and fern allies.*

FAMILY ADIANTACEAE:

Pteris lidgatei (NCN)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Pteris lidgatei* on Oahu. Within these units, 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 ASPLENIACEAE:

Ctenitis squamigera (PAUOA)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Ctenitis squamigera* on Oahu. Within these units, 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.*

Diellia erecta (ASPLENIUM-LEAVED DIELLIA)

Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Diellia erecta* on Oahu. Within these units, 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.*

Diellia falcata (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, Oahu—Lowland Mesic—Unit 7, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Diellia falcata* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Mesic—Unit 4, Oahu—Lowland Mesic—Unit 5, Oahu—Lowland Mesic—Unit 6, and Oahu—Lowland Mesic—Unit 7, 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 Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Diellia unisora (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Diellia unisora* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, and Oahu—Dry Cliff—Unit 8, 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.*

Diplazium molokaiense (NCN)

Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, Oahu—Lowland Mesic—Unit 3, Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Diplazium molokaiense* on Oahu.

(i) In units Oahu—Lowland Mesic—Unit 1, Oahu—Lowland Mesic—Unit 2, and Oahu—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.*

(ii) In units Oahu—Lowland Wet—Unit 1, Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, Oahu—Lowland Wet—Unit 4, and Oahu—Lowland Wet—Unit 5, 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 GRAMMITIDACEAE:

Adenophorus periens (PENDANT KIHI FERN)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Adenophorus periens* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

FAMILY LYCOPODIACEAE:

Huperzia nutans (WAWAEIOLE)

Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, Oahu—Lowland Wet—Unit 16, Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Huperzia nutans* on Oahu.

(i) In units Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7,

Oahu—Lowland Wet—Unit 8, Oahu—Lowland Wet—Unit 9, Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, Oahu—Lowland Wet—Unit 12, Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16, 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 Oahu—Wet Cliff—Unit 6, Oahu—Wet Cliff—Unit 7, and Oahu—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, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

FAMILY MARSILEACEAE:

Marsilea villosa (IHI IHI)

Oahu—Coastal—Unit 9, Oahu—Coastal—Unit 11, Oahu—Coastal—Unit 12, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, and Oahu—Lowland Dry—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Marsilea villosa* on Oahu.

(i) In units Oahu—Coastal—Unit 9, Oahu—Coastal—Unit 11, and Oahu—Coastal—Unit 12, 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 Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, and Oahu—Lowland Dry—Unit 7, 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 PTERIDACEAE:

Doryopteris takeuchii (NCN)

Oahu—Lowland Dry—Unit 6 and Oahu—Lowland Dry—Unit 7, identified in the legal descriptions in paragraph (i) of this section, constitute critical habitat for *Doryopteris takeuchii* on Oahu. Within these units, 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.*

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Dated: June 29, 2011.

Jane Lyder,

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 2011–17162 Filed 8–1–11; 8:45 am]

BILLING CODE 4310–55–P