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50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Endangered Status for 23 Species on Oahu and Designation of Critical Habitat for 124 Species; Final Rule

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R1–ES–2010–0043: 4500030114]

RIN 1018–AV49

Endangered and Threatened Wildlife and Plants; Endangered Status for 23 Species on Oahu and Designation of Critical Habitat for 124 Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), 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 designate 42,804 acres (17,322 hectares) as critical habitat. This designation includes critical habitat for these 23 species, 2 plant species that are already listed as endangered, and revised critical habitat for 99 plant species that are already listed as endangered or threatened. In this final rule we are also recognizing taxonomic revision of the scientific names of nine plant species and revising the List of Endangered and Threatened Plants accordingly. This final rule will implement the Federal protections provided by the Act.

DATES: This rule becomes effective on October 18, 2012.

ADDRESSES: This final rule and final economic analysis are available on the Internet at *http://www.regulations.gov*. Comments and materials received, as well as supporting documentation used in preparing this final rule, are available for public inspection, by appointment, during normal business hours, at the Pacific Islands Fish and Wildlife Office, 300 Ala Moana Boulevard, Box 50088, Honolulu, HI 96850; telephone 808–792–9400; facsimile 808–792–9581. The coordinates or plot points or both from which the critical habitat maps were generated are included in the administrative record for this critical habitat designation, and are available at *http://www.fws.gov/pacificislands*, at *http://www.regulations.gov* at Docket No. FWS–R1–ES–2010–0043, and at the Pacific Islands Fish and Wildlife Office. Any additional tools or supporting information that we developed for this critical habitat designation are also available at the Fish and Wildlife Service Web site and Field Office set out above, and may also be included in the preamble or at *http://www.regulations.gov*.

FOR FURTHER INFORMATION CONTACT: Loyal Mehrhoff, Field Supervisor, Pacific Islands Fish and Wildlife Office (see **ADDRESSES** above). If you use a telecommunications device for the deaf (TDD), you may call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. This is a final rule to list 23 species as endangered under the Act, including 20 native Hawaiian plant species and 3 Hawaiian damselflies. In addition, the rule designates critical habitat for these 23 species, critical habitat for 2 additional plant species that are already listed as endangered, and revised critical habitat for 99 plant species that are already listed as endangered or threatened. These species are on the island of Oahu, in the Hawaiian Islands. In this final rule, we also recognize taxonomic revision of the scientific names of nine plant species and revise the List of Endangered and Threatened Plants accordingly.

The basis for our action. Under the Endangered Species Act, we determine that a species is endangered or threatened based on any of five factors: (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; or (E) other natural or manmade factors affecting its continued existence. We have determined that the 23 Oahu species are currently in danger of extinction throughout all their ranges, as the result of the following current and ongoing threats:

- All of these species face threats from the present destruction and modification of their habitats, primarily from introduced ungulates, such as feral pigs and goats, and the spread of nonnative plants.
- Six of these species face threats from habitat destruction and modification from fire.
- Fourteen species face threats from destruction and modification of their habitats from hurricanes, landslides, rockfalls, and flooding.
- The projected effects of climate change will likely exacerbate the effects of the other threats to these species.
- There is a serious threat of widespread impacts of predation and herbivory on 19 of the 20 plant species by nonnative pigs, goats, rats, and invertebrates; and predation on the three damselflies by nonnative fish, bullfrogs, and ants.
- Some of the plant species face the additional threat of trampling.
- The inadequacy of existing regulatory mechanisms (specifically, inadequate protection of habitat and inadequate protection from the introduction of nonnative species) poses a current and ongoing threat to all 23 species.
- There are current and ongoing threats to nine plant species and the three damselflies due to factors associated with small numbers of populations and individuals.
- The three damselflies face further threats from the loss of native host plants, from habitat degradation and loss due to agriculture and urban development, from stream diversion and channelization, and by dewatering of aquifers.
- 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.

This rule designates critical habitat for 25 species and revises critical habitat for 99 species. Under section 4(b)(2) of the Act, we are required to designate critical habitat based on the best scientific data available and after taking into consideration the economic impact and other relevant impacts of an area being considered for designation. The Secretary (of the Interior) may exclude an area from critical habitat if the benefits of exclusion outweigh the benefits of designation, unless the exclusion will result in the extinction of the species.

- This rule designates a total of 42,804 acres (ac) (17,322 hectares (ha)) as critical habitat.
- We fully considered comments from the public and peer reviewers on the proposed rule and made additional field visits, in order to refine our designation and remove areas that are not essential to the conservation of the species. We found changes in land use had occurred in certain areas within the proposed critical habitat that preclude these areas from supporting the primary constituent elements, and that these areas do not meet the definition of critical habitat.
- A total of 307 ac (124 ha) have been removed in this final designation from the area originally proposed, as a result of refinement in unit areas made in response to public comments and additional field visits. These areas do

not meet the definition of critical habitat.

• In addition, Department of Defense lands on Naval Station Pearl Harbor Lualualei Branch (NAVMAG PH Lualualei) and Naval Radar Transmittal Facility at Lualualei (NRTF Lualualei) (380 acres; 154 hectares) with a completed and effective integrated natural resource management plan (INRMP) have been exempted from this final designation under section 4(a)(3) of the Act.

• All lands being designated as critical habitat are either (1) currently considered to be occupied by one or more of the 124 species, and contain physical or biological features essential to the conservation of the species by supporting the life-history needs of the species and that may require special management, or (2) areas outside the geographical areas occupied by the species at the time of listing, which the Secretary has determined are essential for the conservation of the species.

Peer reviewers support our methods. We obtained opinions from knowledgeable individuals with scientific expertise to review our technical assumptions, analysis, and whether or not we had used the best available information. These peer reviewers generally concurred with our methods and conclusions and provided additional information, clarifications, and suggestions to improve this final rule.

Previous Federal Actions

Federal actions for these species prior to August 2, 2011, are outlined in our proposed rule (76 FR 46362), which was published on that date. Publication of the proposed rule opened a 60-day comment period, which closed on October 3, 2011. In addition, we published a public notice of the proposed rule on August 6, 2011, in the local Honolulu Star Advertiser newspaper. On April 12, 2012 (77 FR 21936) we made available the draft economic analysis (DEA) on proposed critical habitat designation, and opened a 30-day comment period on the DEA, as well as reopened the comment period on the entire August 2, 2011 proposed rule (76 FR 46362). This second comment period closed on May 14, 2012.

Background

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 final 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 pose threats to 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 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 (16 U.S.C. 1531 *et seq.*) that occur in these shared ecosystems.

We are listing *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 (*Megalagrion nigrohamatum nigrolineatum*), crimson (*M. leptodemas*), and oceanic (*M. oceanicum*) 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, 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, Platydesma cornuta* var. *cornuta, Psychotria hexandra ssp. oahuensis, Pteralyxia macrocarpa, Zanthoxylum oahuense* Animals: blackline Hawaiian damselfly, crimson 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 pose threats to the species and that may be common to all of the species at the ecosystem level (see discussion below in Summary of Factors Affecting the 23 Species). For example, climate change 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 rule; it is not applicable to any of the other species being listed. 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 rule, we are designating critical habitat for the 23 Oahu species which we have found to meet the definition of an endangered species. We are also designating critical habitat for two Oahu plants that are already listed as endangered species but for which critical habitat has not been previously designated. In addition, we are revising 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 revising critical habitat for these species because since then, we have learned that many native Hawaiian plants and animals 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 revision of critical habitat is solely based on our determination of the lands that meet the statutory definition of critical habitat (16 U.S.C. 1532(5) and other applicable provisions (e.g., 16 U.S.C. 1533(4)(b)(2)), 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 rule.

In this rule, we are designating critical habitat for 124 species in 62 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 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 individual species that do not presently occupy that particular unit, but depend on that ecosystem type for recovery purposes. Where the unit is not known to be 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 areas for recovery in the case of a stochastic event at one or more locations where the species occurs.

Each of the designated areas represents critical habitat for multiple species, based upon their shared habitat requirements, and takes into account any species-specific conservation needs as appropriate (see discussion below in Methods). 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, pp. 7–10). It was formed from two shield volcanoes, the Koolau Volcano and the Waianae Volcano, 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, pp. 7–10; Rowland and Garcia 2004, p. 1). 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, pp. 7–10; Wagner *et al.* [adapted from Price (1983) and Carlquist (1980) 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 Koolau rain shadow (Blumenstock and Price 1972, p. 156; Wagner *et al.* [adapted from Price (1983) and Carlquist (1980) 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.* [adapted from Price (1983) and Carlquist (1980)] 1999, pp. 38, 40). Rainfall ranges from less than 20 inches (in) (50 centimeters (cm)) to more than 250 in (635 cm) 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.* [adapted from Price (1983) and Carlquist (1980)] 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 rule, 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 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 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 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 980 ft (300 m) in elevation, generally within a narrow zone above the influence of waves to within 330 ft (100 m) inland, sometimes extending further inland if strong prevailing onshore winds drive sea spray and sand dunes into the lowland zone (The Nature Conservancy (TNC) 2006a). The coastal 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 listed as endangered in this final 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 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 listed as endangered in this final rule, are reported from 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, Melicope makahae, Platydesma cornuta* var. *decurrens, Pleomele forbesii, Pteralyxia macrocarpa,* and *Tetraplasandra lydgatei,* and the oceanic Hawaiian damselfly, which are listed as endangered in this final rule, are reported from 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, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa,* and *Zanthoxylum oahuense,* and the blackline, crimson, and oceanic Hawaiian damselflies, which are listed as endangered in this final rule, are reported from 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 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 listed as endangered in this final rule, are reported from 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 listed as endangered in this final rule, are reported from 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 listed as endangered in this final rule, are reported from this ecosystem (HBMP 2008; TNC 2007).

Description of the 23 Species

Below is a brief description of each of the 23 species, 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, there were 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 (Lau 2001, in litt.; 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 between 1,830 and 3,000 ft (558 and 900 m) (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 from nine locations 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 between 1,000 and 2,500 ft (305 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 4 known occurrences, totaling fewer than 60 individuals, sparsely scattered over a much smaller area of the southern Koolau range. These occurrences include Kului-Hawaii Loa, Wailupe, Mauumae, and Waialae Nui, with an unconfirmed report of individuals in Pia Valley (HBMP 2008; Lau 2008, in litt.).

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 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 20 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 polymorpha-Dicranopteris linearis* forest in the lowland wet ecosystem at 1,600 ft (488 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; Bakutis 2008, in litt.). 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 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 areas. It was considered ''locally common'' and a collection was taken from a ''large colony'' in 1985 (Takeuchi 1985, in litt.; Wagner *et al.* 1999, p. 763; Lau 2006a, in litt.). Prior to October 2005, there were 34 wild individuals in 3 occurrences (15, 8, and 11 individuals, respectively) in the subgulches of

Waianu Valley (Bakutis 2005a, in litt.). In 2005, the third occurrence was discovered crushed by a tree, leaving six living individuals (Bakutis 2005a, in litt.). 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 (Bakutis 2006a, in litt.). In addition, 4 more individuals were discovered at the site of the first occurrence, bringing the total number of wild individuals to 26 (Bakutis 2006b, in litt.). 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 (Bakutis 2006a, in litt.; Bakutis 2006b, in litt.). 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 wet *Metrosideros* forests at elevations between 1,600 and 2,200 ft (490 and 670 m) in the lowland wet and wet cliff ecosystems (TNC 2007; HBMP 2008; Bakutis 2008, in litt.). 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 (Perlman 2003, in litt.). *Cyrtandra sessilis* is currently known from 4 occurrences totaling approximately 83 individuals: 75 individuals along the Waikane-Schofield Trail in Kahana Valley, 1 individual at Lulumahu Gulch, 2 individuals in Wailupe, and 5 individuals at Hawaii Loa Ridge near Pia Valley (Perlman 2003, in litt.; Bakutis 2006c, in litt.; HBMP 2008; Bakutis 2008, in litt.).

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 the lowland wet ecosystem (Wagner *et al.* 1999, p. 781; HBMP 2008; Lau 2011, in litt.). *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 between 800 and 3,000 ft (240 and 900 m) (HBMP 2008). Plants have not been observed in these areas since then. Individuals likely representing *C. waiolani,* based on vegetative characteristics, were seen in 1994, along the ridge between Kaipapau and Maakua (Lau 2011, in litt.). In 2005, it was thought there was a small chance that individuals found on the Kualono Ridge near Kaaawa could be *C. waiolani,* and cuttings were taken for propagation and positive identification when flowering and fruiting occurred (Hawaii Department of Land and Natural Resources (HDLNR) 2005a; U.S. Army 2006; Bakutis 2008, in litt.; Ching 2009, in litt.; Lau 2009, in litt.); however, these plants were found not to be *C. waiolani* (Lau 2011, in litt.). Many areas within the lowland wet ecosystem in the Koolau Mountains have not been surveyed for this species. The Koolau mountain range is over 35 mi (58 km) in length. Historical 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 possibly many more individuals in the wild. The plants were only known from a ridge between Kaipapau and Maakau in 1994, and from Kahana in 2005, but those plants are no longer present, which represents a population decline from seven (and possibly 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 2008, in litt; Lau 2009 and 2011, in litt.).

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 between 140 and 300 ft (43 and 91 m) (NTBG 2007a, 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 50 to 100 plants along the main trail to the summit, with individuals on the Kuilei cliffs and the southwest-facing gulches above Munro Trail on the outer slopes of the crater, totaling 160 to 200 individuals on Diamond Head (NTBG 2007, p. 1; Lau 2011, in litt.).

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 between 1,100 and 1,500 ft (335 and 460 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, *K. degeneri* is known from Makaha Valley. In addition, individuals of this species may also occur in Makua Valley and at Kahanahaiki. Confirmation of the identification of these individuals is difficult because another related species, *Korthalsella platycaula,* is also found in Makua Valley (Lau 2001b and 2011, in litt.; 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 between 2,400 and 4,000 ft (730 and 1,200 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 a few scattered locations in 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, between elevations of 1,300 and 2,260 ft (400 and 700 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 10 scattered occurrences totaling fewer than 60 individuals from Kawailoa to Waimalu (NTBG 2007, p. 3; HBMP 2008; Lau 2011, in litt.).

Melicope makahae (alani), a shrubby tree in the rue family (Rutaceae), occurs in mesic forest and shrubland in the lowland mesic and dry cliff ecosystems

in the Waianae Mountains, at elevations between 2,200 and 2,900 ft (670 and 890 m) (Stone *et al.* 1999, p. 1,194; U.S. Army 2006; TNC 2007; HBMP 2008; Lau 2011, in litt.). Historically, *M. makahae* was found in 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 between 1,900 and 2,500 ft (580 and 760 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 between 1,990 and 3,000 ft (600 and 900 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, and dry cliff ecosystems in the Waianae and Koolau Mountains, at elevations between 800 and 2,900 ft (240 and 900 m) (Wagner *et al.* 1999, p. 1,352; TNC 2007; HBMP 2008). Historically, *P. forbesii* was found in at least 11 locations, totaling an unknown number of individuals, in the Waianae Mountains (HBMP 2008). Currently, there are approximately 19 occurrences totaling 290 to 307 individuals, from Keawaula, Kaluakauila, Kuaokala, Kahanahaiki, the east and south rim of Makua Valley, the rim of Waianae Kai Valley, Keaau, Makaha, Kamaileunu, Kolekole Pass, Puu Hapapa, Puukaua, Ekahanui, Halona, Palawai, and Nanakuli, in the Waianae Mountains, and one occurrence of a few individuals in the Koolau Mountains (Lau 2011, in litt.; 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 between 1,080 and 2,000 ft (330 and 600 m) (Wagner *et al.* 1999, p. 1,166; TNC 2007; HBMP 2008). Two varieties of this subspecies, var. *hosakana* and var. *oahuensis,* were historically known only from the northern Koolau Mountains, while var. *rockii* was known only from the southern Koolau Mountains (Lau 2011, in litt.). This species is currently known from three occurrences: one occurrence of 8 to 9 individuals in Maakua Gulch; one individual at Opaeula Gulch; and an estimated fewer than 10 individuals scattered between Kaipapau and Kaluanui, just south of Maakua Gulch (Bakutis 2005, in litt.; 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 between 1,100 and 2,800 ft (340 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 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 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 populations 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 Kulepeamoa Ridge. These occurrences total 8 individuals (HBMP 2008).

Zanthoxylum oahuense (ae), a small tree in the rue family (Rutaceae), occurs in wet forest in the lowland wet ecosystem at elevations between 2,060 and 2,720 ft (630 and 830 m) (Wagner *et al.* 1999, p. 1,216; TNC 2007; HBMP 2008). This species was historically known from 17 locations scattered along the entire length of the Koolau Mountains (HBMP 2008). Currently, *Z. oahuense* is found in the Koolau Mountains from Halawa-Kalauao ridge to ridges in Moanalua-Kamananui-Manaiki, and further east at Hawaiiloa Ridge, in 5 occurrences totaling 21 to 25 individuals (U.S Army 2006; HBMP 2008; Lau 2011, in litt.).

Animals

The crimson Hawaiian damselfly (*Megalagrion leptodemas*) 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, 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 (Englund *et al.* 2003, p. 6). Currently, only three occurrences of the crimson Hawaiian damselfly are known, all from the Koolau Mountains in the lowland wet and wet cliff ecosystems at Moanalua, north Halawa, and Maakua (TNC 2007; Polhemus 2008a, in litt.; HBMP 2008; Preston 2011, in litt.). This species was last observed in the lowland wet ecosystem at Waiawa in the late 1990s (Englund 1999, p. 229). 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 (*Megalagrion nigrohamatum nigrolineatum*) is a moderately-sized and delicate subspecies (Polhemus and Asquith 1996, p. 73). It occurs in the slow sections or pools along 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 under stones or in mats of algae (Williams 1936, p. 318; Zimmerman 1948a, pp. 371–372).

The blackline Hawaiian damselfly was known historically from the Koolau and Waianae Mountains, from sea level to over 2,400 ft (730 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, Kaipapau, Maakua, upper Kaluanui, Palaa, Helemano headwaters, Poamoho, Kahana, Waiahole, Waiawa, Kaalaea, Waihee, Kahaluu, north Halawa, Heeia, Kalihi, and Maunawili (TNC 2007; Polhemus 2008a, in litt.; Wolff 2008, in litt.; HBMP 2008; Preston 2011, in litt.). 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 (Polhemus 2008c, in litt.).

The oceanic Hawaiian damselfly (*Megalagrion oceanicum*) 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 12 sites above 300 ft (100 m) in elevation on the windward side of the Koolau Mountains at Kahawainui, Wailele, Koloa, Kaipapau, Maakua, upper Kaluanui, Kawaiiki, Opaeula, upper Helemano, Makaua, Waihee, and Kahaluu, in the lowland mesic, lowland wet, and wet cliff ecosystems (TNC 2007; Polhemus 2007, pp. 237–239; HBMP 2008; Preston 2011, in litt.). 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 Comments and Recommendations

On August 2, 2011, we published a proposed rule to list these 23 Oahu species as endangered throughout their ranges, and to designate critical habitat for 124 species (76 FR 46362). The comment period for the proposal opened on August 2, 2011, and closed on October 3, 2011. We requested that all interested parties submit comments or information concerning the proposed listing and designation of critical habitat for the 124 species. We contacted all appropriate State and Federal agencies, county governments, elected officials, scientific organizations, and other interested parties and invited them to comment. In addition, we published a public notice of the proposed rule on August 6, 2011, in the local Honolulu Star Advertiser newspaper, at the beginning of the comment period. On April 12, 2012, we published a document (77 FR 21936) announcing the availability of our draft economic analysis, requesting comments on it until May 14, 2012, and reopening the comment period on the August 2, 2011, proposed rule (76 FR 46362) until that time as well.

During the comment periods, we received a total of 55 comment letters. We did not receive any requests for public hearings. Four commenters were peer reviewers, 5 were State of Hawaii agencies, 1 was a Federal agency (U.S. Navy), and 45 were nongovernmental organizations or individuals. Due to the nature of the proposed rule, we received combined comments from the public on both the listing action and the critical habitat; we have therefore addressed these issues in a single comment section.

Four of the comment letters supported the listing and designation of critical habitat for the Oahu species. Thirty-one commenters requested that we exclude 695 ac (281 ha) (representing entire or portions of five different critical habitat units), based on possible economic effects of the designation. We reviewed all comments we received for substantive issues and new data regarding the proposed listing of 23 species and designation of critical habitat for 124 species. We have fully considered all substantive comments in this final rule. Written comments we received during the comment periods are addressed in the following

summary. For readers' convenience, we have combined similar comments into single comments and responses.

Peer Review

In accordance with our peer review policy published in the **Federal Register** on July 1, 1994 (59 FR 34270), we solicited expert opinions from 13 knowledgeable individuals with scientific expertise on the Oahu plants and damselflies and their habitats, including familiarity with the species, the geographic region in which these species occur, and conservation biology principles. We received responses from four of the peer reviewers who were solicited. These four peer reviewers generally supported our methodology and conclusions. One reviewer supported the listing and critical habitat for the Oahu species, one reviewer supported protection of the stream habitat essential to the Hawaiian damselflies, and all four reviewers provided new information on one or more of the Oahu species, which was incorporated into this final rule. We reviewed all comments received from the peer reviewers for substantive issues and new information regarding the listing of 23 species and designation of critical habitat for 124 species. Peer reviewer comments are addressed in the following summary and incorporated into the final rule as appropriate.

Peer Reviewer Comments

(1) *Comment:* One peer reviewer suggested that we use the more current and accepted terms ''ferns and lycophytes'' instead of ''ferns and allies'' in the published rule.

Our Response: We agree that ''ferns and lycophytes'' is the currently accepted terminology; however, changing the term ''ferns and allies'' to ''ferns and lycophytes'' at 50 CFR 17.12 and at 50 CFR 17.99(j) would require a separate rulemaking to amend the Code of Federal Regulations (CFR), not only for the Hawaiian species listings, but for all previously listed species nationwide. This rulemaking would also require an opportunity for public review and comment, which we are unable to accommodate in this final rule.

(2) *Comment:* One peer reviewer disagreed with our statement that ''many native Hawaiian plants and animals currently occupy only areas of marginal habitat because the threats are reduced in those areas,'' and suggested that the areas where the species currently occur constitute their prime habitat, not marginal habitat.

Our Response: Prime habitat and marginal habitat are not terms used in the Act. However, we agree that some native Hawaiian plants and animals thrive in areas that are ''marginal'' (i.e., not dominated by other native species) and have modified our statement in this final rule. The areas designated as critical habitat in this final rule include both occupied and unoccupied habitat.

(3) *Comment:* One peer reviewer expressed concern regarding the potential threat to the three proposed Hawaiian damselflies from the use of biopesticides (pesticides derived from natural materials such as animals, plants, bacteria, and minerals) to combat, for example, mosquitoes.

Our Response: We do not have sufficient data to evaluate the effects that biopesticides, in particular, *Bacillus thuringiensis israelensis* (Bti), may have on Hawaiian damselflies. Therefore, Bti is not considered a current threat to the three proposed Hawaiian damselflies because the specific impacts to these damselflies are unknown at this time.

(4) *Comment:* Two peer reviewers provided information from their recent surveys for species of *Megalagrion* and stated that survey results demonstrated that only streams without nonnative fish provide habitat for native damselflies, and that these streams are crucial for the continued survival of *Megalagrion.* The commenters also stated that, in addition to predation by nonnative fish, siltation of stream gravel beds and other stream modifications resulting from erosion of nearby riparian habitat caused by the actions of feral ungulates is a significant threat to *Megalagrion* species. The commenters recommended that the Service should try to protect the remaining stream habitat that is free of nonnative fish, eliminate nonnative fish in the streams in which they occur, and restore streams and surrounding habitat to provide suitable habitat for Hawaii's *Megalagrion* and other native aquatic species. They also stated that the positive impacts from the removal of nonnative fish and ungulates in aquatic and surrounding habitat will improve overall environmental conditions, that native Hawaiian damselfly larvae may effectively control mosquitoes in place of nonnative fish, and that removal of ungulates in stream areas may reduce the incidence of leptospirosis in Hawaii, which has the largest number of reported cases of this human-health hazard in the United States.

Our Response: We agree that habitat degradation and destruction by feral ungulates and predation of *Megalagrion* spp. by nonnative fish are significant threats to the three species of damselflies in this rule (see Factor A and Factor C, below). Listing these species as endangered and designating their critical habitat will provide conservation benefits including: Protection from being jeopardized by Federal activities; protections against the adverse modification of critical habitat; restrictions on take and trafficking; a requirement that the Service develop and implement recovery plans; authorization to seek land purchases or exchanges for important habitat; and Federal aid to State conservation departments and cooperative endangered species agreements. Listing also lends greater recognition to a species' precarious status, encouraging conservation effort by other agencies, independent organizations, and concerned individuals.

The Service has identified high-quality stream habitat in the State of Hawaii and participates in several programs that provide for stream habitat restoration. One of these programs is the Hawaii Fish Habitat Partnership, whose members developed a strategic plan for implementation of stream restoration projects. Also, funding for implementation of stream restoration activities is available through the National Fish Habitat Action Plan (which includes Federal, State, and private partners), and through the National Fish Passage Program (Service), which will allow for migration of native fish and invertebrates (while excluding nonnative fish) into essential headwater stream reaches. Currently, there are two stream restoration projects funded by these programs on the windward side of Oahu. In 2009, funding was provided to restore native habitat in Waihee Stream and provide a barrier to prevent nonnative fish passage into the upper reaches of the stream where the blackline Hawaiian damselfly occurs. In 2010 and 2011, funds were provided to initiate restoration of habitat for native fish and the blackline Hawaiian damselfly at the lower elevations of Heeia Stream. Additional funding will be pursued to restore the habitat further upstream and to construct a barrier to prevent nonnative fish passage into the upper elevation watershed.

Comments From the State of Hawaii

(5) *Comment:* The Department of Business, Economic Development & Tourism (DBEDT), Office of Planning commented that the proposed rule for the Oahu species is subject to Hawaii Coastal Zone Management (CZM) Program Federal consistency review, pursuant to section 307(c) of the Coastal Zone Management Act (16 U.S.C. 1451 *et seq.*) and 15 CFR part 930, subpart C. In their letter, DBEDT stated that Federal consistency review is required

because the Federal agency activity will occur within the Hawaii CZM area, which includes all lands of the State (Hawaii Revised Statutes Chapter 205A), and will affect coastal uses and resources (i.e., any land or water use or natural resource of the coastal zone (15 CFR 930.11(b))). In addition, DBEDT cited *Palila* v. *Hawaii Department of Land and Natural Resources* [DLNR], 471 F. Supp. 985 (Haw. 1979), as a case where no Federal lands or Federal funds were involved yet Hawaii DLNR was held liable for its non-Federal actions within palila critical habitat.

Our Response: The *Palila* case was based on section 9 of the Act, which makes it a crime for anyone to ''take'' (defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt any of these actions) an endangered species. This provision of the Act can be asserted by private citizens or by the Federal Government. In the *palila* lawsuit, private nonprofit organizations claimed that DLNR was taking the Palila by maintaining populations of feral sheep and goats in the bird's habitat. The fact that the bird's habitat was designated critical habitat had no legal relevance to this allegation; the designation played only an informational role in identifying habitat important to the species. There is no regulatory connection between the Act's section 9 prohibition against ''take'' of a listed species and the designation of critical habitat.

The designation of critical habitat does not physically alter any coastal resources or uses, initiate any activity or a series of activities with effects on coastal resources or uses, or direct future agency actions that affect or alter coastal resources or uses. The designation of critical habitat simply requires a Federal agency proposing an activity that may itself affect the coastal zone to consult with the Service under section 7(a)(2) of the Act to ensure that the activity does not destroy or adversely modify critical habitat. It is the Federal agency activity that results in reasonably foreseeable effects on coastal resources or coastal uses that is subject to the consistency requirement of the Coastal Zone Management Act (CZMA). It is also the responsibility of the Federal agency proposing the activity to ensure the agency complies with the CZMA. The designation of critical habitat does not affect coastal resources or uses in this manner, nor does critical habitat designation affect the coastal zone in other ways. Thus, the designation of critical habitat is not a ''Federal agency activity'' under the CZMA definition, and a consistency determination is not necessary for the designation of critical habitat on Oahu.

(6) *Comment:* The Department of Hawaiian Homelands (DHHL) expressed concerns over the designation of critical habitat on their lands. DHHL requested that we remove Oahu—Lowland Dry—Unit 10, which overlays lands on which they were developing two on-grid 5 megawatt (MW) solar power generating facilities (DHHL 2011, in litt.). In addition, they requested that we remove any pasture lands from Oahu—Dry Cliff—Unit 8 and any DHHL lands that overlay Oahu—Lowland Wet—Units 9 and 13, and Oahu—Wet Cliff—Unit 8 from the final designation, to ensure there are no limitations on their authority over the use and development of their landholdings.

Our Response: We carefully reviewed the areas proposed as critical habitat that overlap lands owned by DHHL. We determined that proposed Oahu—Lowland Dry—Unit 10 (43 ac; 17 ha) is essential for the conservation and recovery of 17 plant species that require the physical and biological features of the lowland dry ecosystem. This unit also provides the species-specific primary constituent element of coral outcrop substrate required for the endangered plant *Chamaesyce skottsbergii* var. *skottsbergii* (Ewa Plains akoko), which was present in the area in 1998, and is endemic only to the Kalaeloa area. The revised recovery strategy for akoko (''Recovery Needs and Strategy for *Chamaesyce skottsbergii* var. *skottsbergii* (Ewa Plains akoko)'') (Service 2012, entire) describes the need for several discrete populations distributed across the landscape, in order to recover this species. For *C. skottsbergii* var. *skottsbergii,* a plant requiring another individual for pollination (obligate-outcrosser) and living 10 years or less (short-lived perennial), we need to establish and maintain 7 to 8 populations across the 4 units proposed in the lowland dry habitat in Kalaeloa (Oahu—Lowland Dry—Units 8–11), although there may be some flexibility within each unit regarding the precise location and management of each population within the unit (HPPRCC 2011; Guerrant *et al.* 2004, pp. 419–441; Neel and Cummings 2003).

We are aware of the planned development of the Kalaeloa Solar One and Two alternative energy facilities (DHHL 2011, in litt.) on lands within, and adjacent to, this unit. The facilities, which are independently owned and operated, are being developed for the purpose of reducing Oahu's dependence on fossil-fuel for power generation. The January 2011 Draft Environmental Assessment prepared for this project states that no Federal funding or Federal authorizations will be required to develop this facility. We are also unaware of any Federal nexus for this project. Accordingly, since a critical habitat designation only triggers a consultation under section 7(a)(2) of the Act for activities that have a Federal nexus, the designation of this unit as critical habitat is not anticipated to have an impact on this project as proposed.

Another 52 ac (21 ha) of proposed Oahu—Dry Cliff—Unit 8 overlap DHHL lands in the Waianae Mountains; however, this area is situated on a steep cliff (greater than 65 degree slope), and does not include any pastureland. Accordingly, the critical habitat designation is not expected to affect any pasture operations. This portion of Oahu—Dry Cliff—Unit 8 is essential to the conservation and recovery of 45 plant species that require the physical and biological features of the dry cliff ecosystem. Based upon landownership information from the State's GIS database, we determined that proposed Oahu—Lowland Wet—Unit 9 and Oahu—Wet Cliff—Unit 8 do not overlap any DHHL lands. We removed 86 ac (35 ha) from proposed Oahu—Lowland Wet—Unit 13 (which corresponds to the critical habitat units *Megalagrion leptodemas* Unit 8—Lowland Wet; *M. nigrohamatum nigrolineatum* Unit 8—Lowland Wet, and *M. oceanicum* Unit 9—Lowland Wet), portions of which overlap DHHL lands. We determined these unoccupied lands, which are too degraded or modified by buildings and roads to support the species, are not essential for the conservation and recovery of the 45 species for which they were proposed as critical habitat. The designation of critical habitat does not affect activities on State or private lands absent a Federal nexus (a program or project authorized, funded, or carried out by a Federal agency), even if such lands are within the geographical boundaries of the critical habitat.

(7) *Comment:* The Hawaii Department of Transportation (HDOT) opposed the designation of critical habitat on lands surrounding the Kalaeloa Barber's Point Harbor, specifically in proposed Oahu—Lowland Dry—Unit 8. The HDOT believes the critical habitat designation will result in a significant delay in implementing the expansion of Kalaeloa Barber's Point Harbor, which would be detrimental to the State and local economy. The HDOT Harbors Division is planning to expand the harbor, which would include purchasing 54 ac (22 ha) within the proposed Oahu—Lowland Dry—Unit 8 area. The HDOT is concerned that designating the 54-ac

(22-ha) area will impact planning efforts that have been underway for decades, within one of Oahu's and the State of Hawaii's most important industrial areas.

Our Response: When proposed, Oahu—Lowland Dry—Unit 8 was comprised of 292 ac (118 ha). Information gained from site visits and from comments we received during the public comment period (76 FR 46362, August 2, 2011; 77 FR 21936, April 12, 2012) confirmed that 193 ac (78 ha) of this unit are not essential to the conservation of the species because they are too degraded to support the species or be functionally restored to support the essential features and habitat for which this area was proposed as critical habitat (see ''Summary of Changes from Proposed Rule,'' below). The 54-ac (22-ha) area to be purchased by HDOT is no longer within Oahu—Lowland Dry—Unit 8.

(8) *Comment:* In a separate letter, the HDOT requested clarification regarding the impact of listing the 23 species on State and federally funded highway projects currently undergoing environmental review, existing HDOT roadways, and mitigation requirements for future HDOT projects in or near designated critical habitat.

Our Response: The listing of the 23 Oahu species and designation of critical habitat would not impact existing HDOT roadways, unless a proposed or ongoing federal action (i.e., a federally funded highway modification) may affect one or more of the 124 Oahu species or designated critical habitat. If an existing or ongoing Federal, federally authorized, or federally funded project is likely to adversely affect one or more of these species or critical habitat, ESA section 7 consultation would be required so the Federal agency can ensure the proposed action(s) are not likely to jeopardize the continued existence of the species, or result in the destruction or adverse modification of designated critical habitat. This would also apply to future HDOT project(s) with a Federal nexus. If such projects would likely result in jeopardy to the listed species or the adverse modification of critical habitat, the Service would identify reasonable and prudent alternatives to minimize such impact. Reasonable and prudent alternatives are alternative actions identified during formal section 7 consultation that can be implemented in a manner consistent with the purpose of the action and the Federal agency's legal authority and jurisdiction. Reasonable and prudent alternatives must be economically and technical feasible, and avoid the likelihood of jeopardizing the continued existence of a listed species or destroying or adversely modifiying critical habitat.

(9) *Comment:* The HDOT, Harbors Division, Planning Office requested information on how the designation of critical habitat in Oahu—Lowland Dry—Unit 8 may affect harbor development in the existing Kalaeloa Barber's Point Harbor area and the proposed acquisition area for harbor expansion.

Our Response: See also our response to Comment (7), above. The designation of critical habitat does not affect activities on State or private lands absent a Federal nexus, even if such lands are within the geographical boundaries of the critical habitat. However, Federal agencies are required to consult with the Service on actions they carry out, fund, or authorize to ensure that their actions will not destroy or adversely modify critical habitat. In this way, a critical habitat designation provides additional protections beyond classifying a species as endangered or threatened by requiring consideration of the effects of Federal actions on areas essential for the conservation of the species. The area being considered for harbor expansion, which was within proposed Oahu—Lowland Dry—Unit 8, was resurveyed by the Service. Those areas that are too degraded to support the species or be functionally restored to support the essential features and habitat are not essential for the conservation of the species, and have been removed from critical habitat. This includes the proposed acquisition area for harbor expansion.

(10) *Comment:* The Hawaii Community Development Authority (HCDA), which expects to acquire lands within the former Barbers Point Naval Air Station at Kalaeloa, requested that lands within the Kalaeloa Northern Skeet Range, which are overlapped by Oahu—Lowland Dry—Unit 11, be excluded from critical habitat. According to HCDA, they are developing a preservation plan for akoko, which occurs on this land, in coordination with the Navy, Hawaii Division of Forestry and Wildlife (HDOFAW), and the Service; the planned development of the renewable energy project in this area will reduce the State's dependence on foreign oil and generate revenue to develop needed infrastructure in Kalaeloa and fund akoko preservation activities. The HCDA is developing a cadre of volunteers to steward the site.

The HDOFAW concurred with the proposed listing of the 23 Oahu species and the designation of critical habitat for 124 species with the exception of Oahu—Lowland Dry—Unit 11. Hawaii DOFAW recommended that the western third of TMK parcel 91013039 (approximately 60 ac (24 ha)) within the unit be removed from critical habitat designation. According to their letter, this portion of the parcel is the most appropriate area for development of a photovoltaic project, because of the absence or low numbers of akoko, due to the dense overgrowth of weeds and tall grasses. The Hawaii DOFAW is recommending that HCDA and the photovoltaic developer enter into a [Hawaii State] Habitat Conservation Plan for the site, in order to secure development rights and provide assurances of funding for akoko conservation.

Our Response: We determined that proposed Oahu—Lowland Dry—Unit 11 (166 ac; 67 ha) is essential for the conservation and recovery of 17 plant species that require the physical and biological features of the lowland dry ecosystem. This unit also provides the species-specific primary constituent element of coral outcrop substrate required for the endangered Ewa Plains akoko, known only from the Kalaeloa area. This area was once the largest known population of akoko and contains the last known wild individuals and approximately 600 outplanted individuals. The revised recovery strategy for akoko (''Recovery Needs and Strategy for *Chamaesyce skottsbergii* var. *skottsbergii* (Ewa Plains akoko)'') (Service 2012, entire) describes the need for several discrete populations distributed across the landscape, in order to recover this species. For *C. skottsbergii* var. *skottsbergii*, a plant requiring another individual for pollination (obligate-outcrosser) and living 10 years or less (short-lived perennial), we need to establish and maintain 7 to 8 populations across the 4 units proposed in the lowland dry habitat in Kalaeloa (Oahu—Lowland Dry—Units 8–11), although there may be some flexibility within each unit regarding the precise location and management of each population within the unit. (HPPRCC 2011; Guerrant *et al.* 2004, pp. 419–441; Neel and Cummings 2003).

We are aware and supportive of the efforts underway by State and the Navy to develop a long-term preservation or conservation plan for *C. skottsbergii* var. *skottsbergii* within this unit. These include the development of a State of Hawaii Habitat Conservation Plan and the conditional transfer of some of the Navy lands within this unit to the HCDA. The State of Hawaii Endangered Species Act already prohibits the take of individual listed plants by the State or any other non-Federal entity, without

State review and authorization. If the lands are transferred by the Navy, the deed will require Grantees and successors to enter into a legally binding conservation and management plan approved by the Hawaii Department of Land and Natural Resources, to ensure protection of *C. skottsbergii* var. *skottsbergii* before conveying the property (U.S. Navy 2011, in litt.), based on the species being State and federally listed. The purpose of this agreement is to ensure the use or development of the transferred property does not adversely affect *C. skottsbergii* var. *skottsbergii*, as long as the species remains listed under the Act. If the Navy lands are transferred to HCDA, a portion of the lands may be used to develop a photovoltaic alternative energy project (HCDA 2012, in litt.; HDOFAW 2012, in litt.). The HCDA plans to use a portion of the revenue generated by commercial use of HCDA property to fund the conservation actions required under a conservation management plan (U.S. Navy 2011, in litt.). The Service is committed to working with the Navy and HCDA in the development of this conservation plan, to ensure it will provide for the long-term conservation of the plant and its habitat. Because of this close coordination, and because the deed restriction stipulates that *C. skottsbergii* var. *skottsbergii* will not be adversely affected, we believe the development of the photovoltaic alternative energy project, as proposed, will not be impacted by the designation of critical habitat in this unit, and it is our intent to work with our partners to facilitate this project.

Comments From Federal Agencies

(11) *Comment:* The Navy requested that the Service exclude Navy lands from critical habitat designation under Section 4(a)(3)(B)(i) of the Act because of benefits provided to the species from the implementation of an integrated natural resources management plan (INRMP). The Navy advised the Service that is was revising the Joint Base Pearl Harbor-Hickam (JBPHH) INRMP, and the finalized plan will address conservation measures for plant species for which critical habitat is proposed on Navy lands (U.S. Navy 2011, in litt.). The INRMP will be fully coordinated with the Service and include an assessment of conservation needs of the listed plant species, a statement of goals and priorities, and a detailed description of the actions to address the needs of the plant species, and will include a monitoring and adaptive management plan.

Our Response: Critical habitat was proposed for 60 plant species within 10 units that overlap Navy lands at Lualualei Valley (NAVMAG PH Lualualei and NRTF Lualualei) (Oahu—Lowland Dry—Units 3, 4, and 5; Oahu—Dry Cliff—Units 4, 5, 6, and 7; and Oahu—Wet Cliff—Units 2 and 5) and at Kalaeloa Barber's Point (Oahu—Lowland Dry—Unit 11). The 10 units are occupied by 28 of the 60 plant species and provide unoccupied habitat essential to the conservation of 32 species. Implementation of the June 2012 Addendum to the Navy's September 2011 final INRMP JBPHH (encompassing Naval facilities of Pearl Harbor Naval Complex, Naval Magazine Pearl Harbor Lualuaei and West Loch Branches, Naval Computer and Telecommunications Area Master Station Pacific Wahiawa, Naval Radio Transmitter Facility Lualualei, Navy-retained lands at Kalaeloa, and Hickam Air Force Base) will provide a conservation benefit for 59 of the 60 plant species for which critical habitat was proposed on Navy lands (76 FR 46362). The Navy's final INRMP and Addendum does not include conservation measures for *Chamaesyce skottsbergii* var. *skottsbergii* (Oahu—Lowland Dry—Unit 11 at Kalaeloa Barber's Point), as the Navy is planning on transferring the property as part of the closure process (or Base Realignment and Closure (BRAC)) of the Barber's Point Naval Facility. The Navy's INRMP also does not cover actions conducted by the Navy on U.S. Coast Guard property. We are exempting critical habitat from Navy lands within Lualualei Valley, based on the implementation of conservation measures described in the 2011 final INRMP and the 2012 Addendum. For detailed information regarding conservation measures for listed plants and their critical habitat provided by the 2011 final INRMP and the 2012 Addendum to the INRMP, please see ''Approved INRMPs,'' below). We are retaining Oahu—Lowland Dry—Unit 11 as critical habitat because the INRMP does not provide a benefit to the species for which that critical habitat unit is designated and the Navy is in the process of transferring ownership of this property.

(12) *Comment:* The Navy commented that they agree with the proposed critical habitat designation within Oahu—Lowland Dry—Units 9, 10, and 11, and that the parcel that is within proposed Oahu—Lowland Dry—Unit 11 is owned by the Hawaii Community Development Authority (HCDA), in accordance with 2005 Defense Base Closure and Realignment Commission (BRAC) law. The Navy has no planned conservation actions for the listed plant species on this site.

Our Response: A review of tax assessor parcel data for Oahu confirms that the Navy does not own lands overlapped by critical habitat units Oahu—Lowland Dry—Unit 9 and Oahu—Lowland Dry—Unit 10. Accordingly, the Navy is no longer subject to requirements under the Act on these lands. Current City and County records indicate that the Navy retains ownership of its lands within Oahu—Lowland Dry—Unit 11 (City and County Real Property Assessment Division 2011). All lands under U.S. Navy ownership or management continue to be subject to requirements under the Act until such time as they are conveyed to other parties. The Navy's 2011 INRMP and 2012 Addendum provide conservation measures that allow exemption of proposed critical habitat on Navy lands at Lualualei; however, the last remaining wild population of *Chamaesyce skottsbergii* var. *skottsbergii* occurs on Navy lands at Barber's Point (Oahu—Lowland Dry—Unit 11). The Service believes the Navy's INRMP does not provide a benefit to the species for which critical habitat was proposed, and we therefore cannot exempt this area from critical habitat.

(13) *Comment:* The Navy commented that the proposed critical habitat within Oahu—Lowland Wet—Unit 5 slightly overlaps Navy land by a small area (0.16 acres (ac) (0.063 hectares (ha)), and that if the intent was for the boundary to follow the ridgeline, no Navy lands would be included in the unit. If true, the Navy recommends that this unit be adjusted to follow the ridge and not overlap Navy property.

Our Response: We have reexamined proposed critical habitat on Navy lands in Lualualei Valley. The Service believes that if conservation measures outlined in the 2010 INRMP and the 2012 Addendum are followed, fences are constructed for ungulate control, nonnative plants are controlled, propagation and outplanting of endangered species on Navy lands is allowed, monitoring and adaptive management actions are completed, and reporting is provided, including development and implementation of a fire management plan, we can exclude areas of Navy land in Lualualei Valley from critical habitat. The portion of Oahu—Lowland Wet—Unit 5 on Navy lands at Lualualei referred to in the comment above is therefore exempted from critical habitat in this rule.

Public Comments on Proposed Oahu—Lowland Dry—Unit 8

Many commenters opposed the designation of critical habitat in proposed Oahu—Lowland Dry—Unit 8, and we grouped similar comments together relating specifically to this proposed unit. These comments are addressed in the following summary.

(14) *Comment:* Several commenters requested that their specific lands within Oahu—Lowland Dry—Unit 8 be excluded from the final designation of critical habitat for akoko due to: Potential significant economic impacts, the lands absence of the physical and biological features essential to the conservation of akoko, or the social or economic benefits of excluding these lands from critical habitat outweighs the conservation benefit to the species that may result from their inclusion in the final designation.

Our Response: Following the publication of the proposed rule, the Service, in coordination with the property owners, conducted a field visit of Oahu—Lowland Dry—Unit 8 in November 2011, to obtain further field verification of the current condition of habitat for akoko. Following the field visit, it was determined that approximately 193 acres of the 292 acres proposed were too degraded to support akoko or to be functionally restored to support the essential features and habitat for akoko. It was further determined during that field visit and a subsequent field visit in June 2012, that 99 acres (40 ha) contained the features essential to the conservation of akoko and could be adequately restored to allow for a functioning population of akoko if re-established. In our April 12, 2012, Notice of Availability of the Draft Economic Analysis (DEA) (77 FR 21936), we advised the public that we were considering these boundary adjustments and requested comment. The DEA did not reflect these revisions to Oahu—Lowland Dry—Unit 8.

Based on the revisions the final rule makes to Oahu—Lowland Dry—Unit 8, many of the specific lands that commenters were concerned with were removed from the designation due to the lack of features or because they were so degraded. These include: (1) Kapolei Harborside, (2) the lands where the biofuel farm is planned, (3) the Wastepile site, (4) the Maritime Industrial area where the harbor expansion is planned, and (5) Ko Olina Resort and Marina property. As a result, we will not address any specific comments concerning the inclusion of these lands in this final rule or the potential impacts from their inclusion. The remaining lands within Oahu—Lowland Dry—Unit 8 overlap two parcels that are part of the Kapolei West planned development area. Comments concerning the inclusion of these lands in the final rule have been fully considered and are addressed in the ''Public Comments on Proposed Oahu—Lowland Dry—Unit 8'' section.

(15) *Comment:* The primary constituent elements (PCEs) for ecosystems are arbitrary and capricious, and are conflicting for the lowland dry area.

Our Response: We disagree. We consider the PCEs to be the specific compositional elements of physical and biological features that are essential to the conservation of the species. This final rule identifies the appropriate PCEs sufficient to support the life-history processes for each species within the ecosystems in which they occur, and reflects a distribution that we believe is essential to the species' recovery needs within those ecosystems. The ecosystems' features include the appropriate microclimatic conditions for germination and growth of the plants (e.g., light availability, soil nutrients, hydrologic regime, and temperature) and space within the appropriate habitats for population growth and expansion, as well as to maintain the historical geographical and ecological distribution of each species. The PCEs are defined by elevation, annual levels of precipitation, substrate type and slope, and the potential to maintain characteristic native plant genera in the canopy, subcanopy, and understory levels of the vegetative community. The PCEs for the lowland dry ecosystem are described in Table 4 of this final rule and were derived from several sources, including:

(a) The Nature Conservancy's Ecoregional Assessment of the Hawaiian High Islands (2006) and ecosystem maps (2007);

(b) Natural Resources Conservation Service's soil type analysis data layer for GIS mapping;

(c) Oahu vegetation analyses by Gagne and Cuddihy (1999, pp. 45–114);

(d) Plant databases from the U.S. Army Environmental (2006) and the National Tropical Botanical Garden;

(e) Geographic information system maps of habitat essential to the recovery of Hawaiian plants (HPPRCC 1998);

(f) GAP (geographic analysis program) vegetation data (GAP 2005);

(g) **Federal Register** documents such as listing rules and 5-year status reviews;

(h) Final critical habitat designation for the island of Oahu (68 FR 35950, June 17, 2003); and

(i) Recent biological surveys and scientific reports regarding species and their habitats.

Where further information was available indicating additional, specific, life-history requirements for some species, the primary constituent elements (PCEs) relating to these requirements are described separately and are termed ''unique'' PCEs for species; for example, we have identified coral outcrop substrate as a unique PCE for *Chamaesyce skottsbergii* var. *skottsbergii* (see Table 5, below).

(16) *Comment:* One commenter disputed the number of occurrences and individuals reported for *Chamaesyce skottsbergii* var. *skottsbergii* in our proposed rule (76 FR 46362; August 2, 2011), based on a September 2011 report by a private consultant on *C. skottsbergii* var. *skottsbergii* at Barber's Point. In addition, the commenter questioned why our total number of individuals of *C. skottsbergii* var. *skottsbergii* did not include the individuals outplanted in the Kalaeloa unit of the Pearl Harbor National Wildlife Refuge, and why we did not include a map of the location of the 1998 *C. skottsbergii* var. *skottsbergii* observation by Whistler (2008).

Our Response: In the September 2011 report provided by the commenter on *Chamaesyce skottsbergii* var. *skottsbergii* at Barber's Point, the author summarized status information for this species. According to the report, *C. skottsbergii* var. *skottsbergii* was found at the Northern Trap and Skeet Range (NTSR), Building 1527, and at the Service's Kalaeloa unit of the Pearl Harbor National Wildlife Refuge (Refuge). No information was provided on the total number of individuals or the numbers of individuals at each location. However, based on the best available information, approximately 700 individuals of *C. skottsbergii* var. *skottsbergii* are present in two occurrences within an area previously used by the Navy as a trap and skeet range for the Barber's Point Naval Air Station, and at the Refuge (U.S. Navy *et al.* 2012). Of these, fewer than approximately 200 are wild individuals. The Whistler (2008) reference mentioned by the commenter was used in our analysis, but was inadvertently omitted from the list of references for the proposed rule.

(17) *Comment:* Designation of critical habitat in Oahu–Lowland Dry–Unit 8 is a taking of property without just compensation.

Our Response: The mere promulgation of a regulation, like the enactment of a statute, does not take private property, unless the regulation on its face denies the property owners

all economically beneficial or productive use of their land. The designation of critical habitat alone does not deny anyone economically viable use of their property. The Act does not automatically restrict all uses of critical habitat, but only imposes restrictions under section 7(a)(2) on Federal agency actions that may result in destruction or adverse modification of designated critical habitat. Furthermore, if in the course of a consultation with a Federal agency, the resulting biological opinion concludes that a proposed action is likely to result in destruction or adverse modification of critical habitat, we are required to suggest reasonable and prudent alternatives that can be implemented in a manner consistent with the intended purpose of the action, that can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, and that are economically and technologically feasible (Service 1998, p. xvii).

(18) *Comment:* The Service did not have accurate land ownership information for Oahu—Lowland Dry—Unit 8.

Our Response: During the initial public comment period on our proposed rule (76 FR 46362; August 2, 2011), we became aware that there were errors in the landownership information for proposed Oahu—Lowland Dry—Unit 8 in the geospatial data sets associated with parcel data from Honolulu County (2008), which were used to identify affected landowners. However, we subsequently received accurate landownership information from the City and County of Honolulu's Real Property Assessment Office (2011). We sent letters to all of the affected landowners we were able to identify, notifying them that the proposed critical habitat designation may overlap some or all of their property. In that letter we also provided general information on the proposed critical habitat designation and that we were considering a revision for proposed Oahu—Lowland Dry—Unit 8.

Public Comments on the Draft Economic Analysis

Many commenters questioned the draft economic analysis (DEA). These comments and our responses are grouped below.

(19) *Comment:* Several commenters questioned our assumption that a Federal nexus may not exist for the planned development projects in Oahu—Lowland Dry—Unit 8, and that by asserting there was no Federal nexus, we may be underestimating the potential impacts resulting from the inclusion of these lands in the final designation of critical habitat for akoko. Commenters further asserted that if there was a Federal nexus, there would be many more than one consultation due to parcels being subdivided, with individual consultations conducted on actions affecting each parcel. One commenter stated they submitted permit applications to the Department of the Army for the expansion of existing buildings, infrastructure and facilities at Ko Olina Resort and Marina within Oahu—Lowland Dry—Unit 8. Another commenter (James Campbell Company LLC) identified several potential activities that could trigger section 7 consultation, including Army Corps of Engineers approval of a regional drainage system, Federal funding for a State highway project, Federal grants to fund harbor expansion, EPA emission permits for energy projects, and Small Business Administration loans. National Pollutant Discharge Elimination System permits under the Clean Water Act for any storm water discharges associated with any of the above development.

Our Response: Following a review of the information we received from public comments and otherwise available to us, we agree there is a reasonable probability that a Federal action agency would be involved with funding, permitting, or otherwise authorizing the planned development project for Kapolei West. Because it now appears that there are only two parcels that we are designating as critical habitat in Oahu—Lowland Dry—Unit 8 that are part of the larger Kapolei West planned development, we anticipate there would likely be only a single consultation involved for the entire master planned development. In our history with such large development projects, it has generally been the case that there is one consultation with the Federal action agency covering the entire project, and not smaller individual consultations on smaller individual components of the project.

That being stated, to evaluate potential impacts from the designation given the uncertainty of whether there may be a Federal nexus and how many specific consultations there may be, we evaluated a range in the DEA and our final rule. At one end of the range, we assume that there will be no Federal nexus. In this case, because there is no regulatory effect under the Act for a designation of critical habitat absent a Federal nexus, we assume there will be no impact from the designation. This constitutes the lower bound that is identified in the DEA, and we still believe this scenario could occur. At the other end of the range, where a Federal nexus is assumed, we also assume that the consultation resulting from the designation of critical habitat would take into consideration the entire master planned project based on past comparable examples. For example, one property owner (James Campbell Company LLC) commented that the entire 107 acres (43 ha) being designated within Oahu—Lowland Dry—Unit 8 fall within the Kapolei West project, which is slated for residential and mixed-use development, with development rights vested by several public approval processes and County ordinance. They also commented that the land use entitlement process for Kapolei West began in the 1980's and was assessed in an Environmental Impact Statement prepared under Hawaii Revised Statutes Chapter 343 (Kapolei West Expansion Area Final EIS, June 2005; James Campbell Company LLC letter dated May 12, 2012). Because the consultation is anticipated to be for the entire master planned community, then the specific number of parcels may not be significant. The final economic analysis rexamined the potential upper-bound of economic costs, including administrative costs to the Service, Federal agencies, and third parties. The estimated combined administrative costs in occupied and unoccupied critical habitat is $145,000 over a 20-year period ($94, 178 using a 7 percent discount rate, $117,075 using a 3 percent discount rate). The total administrative costs (i.e., costs related to section 7 consultation) in occupied areas are estimated to be $105,000 over a 20-year period (or $54,178 using a 7 percent discount rate—$77,075 using a 3 percent discount rate). Combined annualized costs over this period are $8,776 using a 7 percent discount rate, or $7,000 using a 3 percent discount rate (Service 2012, Table ES–12).

(20) *Comment:* One commenter indicated that the time horizon of the DEA, 20-years, was too short a time to evaluate the potential economic impacts of the designation.

Our Response: While Executive Order 12866 and 13563 and Office of Management and Budget (OMB) Circular A–4 clarify the importance for the government to carefully assess, to the best of its abilities, the benefits and costs of proposed rules before making any final determinations, neither Executive Order nor Circular A–4 specify a specific timeframe for analysis. Recent guidance from OMB indicates that if a regulation has no predetermined sunset provision, the agency will need to choose the endpoint of its analysis based on the foreseeable future or the agency's ability to forecast reliably (Office of Management and

Budget, 2011 p. 5). For most agencies, a standard time period of analysis is 10 to 20 years. Additionally, since we identified 21 parcels of property in unoccupied habitat, and the DEA assumed that there would be a single section 7 consultation in each unit, the DEA made the further assumption that there would be, on average, one consultation each year for the next 21 years. This assumption was influenced by the fact that it was unknown when activities would take place in the future that would trigger a consultation and that it was highly unlikely all 21 supposed consultations would occur in the first year (which would provide the most conservative (i.e., highest) economic cost after discounting).

(21) *Comment:* One commenter stated that the DEA understates the economic impact the designation will have on small business.

Our Response: Section 4(b)(2) of the Act requires us to consider the economic impact of designating a particular area as critical habitat for an endangered or threatened species. We also evaluate potential economic impacts of a rulemaking pursuant to Executive Order 12866 (E.O. 12866), which states that a rulemaking will be determined to be economically significant if it will result in an impact of more than $100 million in any given year, and the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.*) as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA; 5 U.S.C. 801 *et seq.*). Under the RFA, whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the 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. The SBREFA amended the RFA to require Federal agencies to provide a certification statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities.

To understand the potential impacts of a critical habitat designation as discussed in the DEA, we evaluate the incremental impacts of the designation as identified by evaluating the additional protections or conservation measures afforded the species through the designation beyond those that the species receives by being federally listed (i.e., baseline conservation measures). Under E.O. 12866, we are required to evaluate the direct and indirect impacts of the designation. The evaluation of these potential impacts is discussed in our final economic analysis (FEA).

Additionally, under the RFA and following recent case law, we are to evaluate the potential impacts to small businesses, but this evaluation is limited to impacts to only directly regulated entities. The designation of critical habitat only has regulatory impact through section 7 of the Act, in which a Federal action agency is required to consult with us on any project that is funded, permitted, or otherwise authorized that may affect designated critical habitat. In other words, critical habitat only has a regulatory effect and therefore impact if a Federal nexus exists. Critical habitat has no regulatory effect or impact under the Act on actions that do not have a Federal nexus. Since Federal action agencies are the only directly regulated entities as a result of the designation of critical habitat, it is therefore reasonable for us to conclude that the designation of critical habitat does not directly regulate small business entities and, therefore, does not significantly impact them. As a result, we believe that we have accurately assessed potential impacts to small business entities in the rulemaking, and can reasonably certify that this designation will not have a significant impact on a substantial number of small business entities. For a further discussion of our rationale, please see the Required Determinations section of this final rule, below.

(22) *Comment:* The DEA misstates the development planned within Oahu—Lowland Dry—Unit 8. The commenter claims that the DEA part II failed to discuss the potential that a critical habitat designation could influence the State Land Use Commission to reclassify lands from its current status as part of the Urban District to Conservation District. Furthermore, the commenter claims that the DEA incorrectly assumes that some of the parcels within Oahu—Lowland Dry—Unit 8 are classified as agricultural and that the DEA fails to acknowledge that some of the parcels also fall within the Kapolei West project.

The commenter also states that DEA misstates the intended use of parcel 191014041, based on the Kapolei Area Long Range Master Plan, and that the DEA needs to provide an assessment for parcel 191015004, which the Honolulu Land Information System (HOLIS) database identified as having no assessment. The HOLIS database is used to collect, maintain, and distribute geo-referenced information necessary to support City of Honolulu operations, including land use, permits, tax, infrastructure, and environmental data.

Our Response: Table 3.3 of the DEA and the associated discussion identify the zoning status for each parcel within Oahu—Lowland Dry—Unit 8. None of the parcels are identified in the table as having agricultural zoning, but rather as being zoned for commercial or industrial purposes. However, in the DEA's introductory description of Oahu—Lowland Dry—Unit 8, the DEA did cite the commenter's description of the area from its Web site, which stated at that time that some of the lands within Oahu—Lowland Dry—Unit 8 were still zoned as agriculture, although a petition was filed with the State Land Use Commission to rezone the area for industrial. Since then, the land classification on the Web site has been updated, and the FEA has factored this into the description and analysis.

The commenter is correct that part II of the DEA did not discuss the potential that a critical habitat designation could have on influencing the State Land Use Commission to reclassify its lands to a more conservative category. This is because the Service is unaware of any instances over the past 10 years, when critical habitat designations were initially promulgated across the State of Hawaii, where the State Land Use Commission reclassified lands based on critical habitat.

The DEA's discussion of the parcels in Oahu—Lowland Dry—Unit 8 did not acknowledge that some of the parcels may have fallen within the Kapolei West project. The discussion in the FEA acknowledges the existence of this master plan.

The commenter did not state what the characterization of TMK (tax map key) 91014041 was according to their reading of the Master Plan. The commenter stated only that the DEA was incorrect. A review of the zoning characteristics identified in the DEA match that in HOLIS. The commenter helpfully provided the current TMK for that identified by the Service (TMK 91015004) that is no longer in the HOLIS database. The correct TMK for this parcel is 91015026. The Honolulu Real Property Assessment Division clarified that TMK 91014041 is primarily zoned P–2 (General Preservation), which typically carries a low value. Since the assessment did not take into account the A–2 (Medium Density Apartments), B–2 (Community Business), and IMX–1 (Industrial Mixed Use) portions, it is undervalued. TMK 91015026 contains a 3-acre common element value for a condominium

project, and eight CPR's carry the remaining condominium value for that parcel (Palenske 2012, pers. comm.). The FEA will be updated to reflect the characteristics and valuations for this parcel.

(23) *Comment:* The DEA misstates land ownership within Oahu—Lowland Dry—Unit 8.

Our Response: This comment references statements made in the Incremental Effects Memorandum that is appended to the DEA. The Incremental Effects memorandum is an early, iterative statement as to what potential effects may result from critical habitat designation. Through the rulemaking process, we received clarifications of land ownership, and this information has been incorporated into the FEA and final rule.

(24) *Comment:* The DEA misstates the status of development within Oahu—Lowland Dry—Unit 8.

Our Response: The DEA states that of the 13 parcels in Oahu—Lowland Dry—Unit 8 analyzed, only one, at the time, had an active permit. This information came from the HOLIS Web site. This information has been updated through the information and clarifications we received as a result of the rulemaking process.

(25) *Comment:* The DEA fails to consider State and county land use plans.

Our Response: The commenter believes the DEA should also expressly consider the General Plan for the City and County of Honolulu (2002) and the Ewa Development Plan (2000). The DEA relied on current assessment and zoning information from the City and County of Honolulu, as well as more recent planning documents, some of which are affiliated with the commenter. In summary, the DEA was clear about the planned development of all parcels in Oahu—Lowland Dry—Unit 8 for commercial and industrial purposes, despite their current status as relatively undeveloped properties.

(26) *Comment:* The DEA understates the economic impact of designation. The DEA inappropriately uses property tax assessed values rather than market values. The DEA inappropriately uses a ''per acre'' approach to determine economic impact potential, and it does not take into account the impact on development cost and revenue streams of prohibiting development on a portion of land.

Our Response: In developing our DEA we relied on the publicly available information from the Honolulu Land Information System (HOLIS; *http://gis.hicentral.com*). This database contains the latest assessed values for real properties originating from the City and County of Honolulu Department of Budget and Fiscal Services Real Property Assessment Division (*https://www.realpropertyhonolulu.com*). According to the Division's Web site, sec. 8–7.1, Revised Ordinances of Honolulu, requires the fair market value of all taxable real property to be determined and annually assessed by the market data (sales comparison) and cost approaches to value. All properties are valued at 100 percent of market value. While actual sales values may deviate from current assessed values based on factors such as economic conditions or site characteristics, we believe that the City and County of Honolulu's database reflects the best available information for our assessment of potential economic impacts.

As explained in the DEA, the current market value for property (as best represented by the assessed sales price absent a direct sale) reflects the present value of future revenue streams that the property would generate under anticipated development scenarios. Lacking any information to credibly differentiate within a parcel how development may or may not be suitable, given certain land characteristics, the analysis reasonably assumed that each parcel analyzed was uniform in its physical development characteristics, and, correspondingly that the total assessed value of a parcel reflected these uniform characteristics for the purposes of this analysis. As explained in the DEA, the analysis makes the case that the current market assessment for land in this area primarily reflects the discounted future earnings that the land is expected to generate after development (i.e., growth premium).

(27) *Comment:* In section 3.5 of the DEA, the Department's 137-acre parcel in Kalaeloa was assessed at approximately $48,000,000 based on the Kalaeloa Master Plan and the General Urban land use designation under HCDA Chapter 15–215. However, since the Hawaiian Homes Commission (HHC) has land use authorities that cannot be superseded by other authority, it is not clear that the urban designation used as a basis for assessment would be the designation the HHC would choose. For example, the HHC could designate these lands at a high or more intensive urban, or industrial value, that would result in a higher land assessed value.

Our response: We appreciate the information concerning the categorization for the assessed land value; however, in developing our DEA, we relied on the publicly available information from HOLIS (*http://gis.hicentral.com*). This database contains the latest assessed values for real properties originating from the City and County of Honolulu Department of Budget and Fiscal Services Real Property Assessment Division (*https://www.realpropertyhonolulu.com*). According to the Division's Web site, sec. 8–7.1, Revised Ordinances of Honolulu, requires the fair market value of all taxable real property to be determined and annually assessed by the market data (sales comparison) and cost approaches to value. All properties are valued at 100 percent of market value. While actual sales values may deviate from current assessed values, based on factors such as economic conditions or site characteristics, we believe that the City and County of Honolulu's database reflects the best available information for our assessment of potential economic impacts. Further, any changes in land use by HHC is speculative at this time.

Other Public Comments Not Related to Oahu—Lowland Dry—Unit 8

(28) *Comment:* All species of *Chamaesyce* are now recognized as species of *Euphorbia.*

Our Response: We agree. Steinman and Porter's 2002 (p. 473) molecular data for classification of Euphorbieae and the analysis of Bruyns *et al.* (2006, pp. 416–417) found that *Chamaesyce* is nested among species of *Euphorbia.* However, changing the names for the endangered Oahu plants *Chamaesyce celastroides* var. *kaenana, C. deppeana, C. herbstii, C. kuwaleana, C. rockii* and *C. skottsbergii* var. *skottsbergii* in 50 CFR 17.12 and in 50 CFR 17.99(j) would require a separate rulemaking, not only for the Hawaiian species listings, but for all previously listed species.

(29) *Comment:* One landowner questioned the designation of critical habitat in several units, including Oahu—Lowland Wet—Unit 9, Blackline Hawaiian damselfly—Unit 4—Lowland Wet, Crimson Hawaiian damselfly—Unit 4—Lowland Wet, and Oceanic Hawaiian damselfly—Unit 5—Lowland Wet, and the existing plant critical habitat designated in 2003 under and next to Hawaii Interstate H–3, near the summit of the Koolau Mountains.

Our Response: Although no specific objections to the proposed critical habitat were given, we provided the commenter with maps of Oahu—Lowland Wet—Unit 9 and all three damselfly units (Blackline Hawaiian damselfly—Unit 4—Lowland Wet, Crimson Hawaiian damselfly—Unit 4—Lowland Wet, and Oceanic Hawaiian damselfly—Unit 5—Lowland Wet),

which geographically correspond to the same area (i.e., they completely overlap). These units provide critical habitat for 44 plant species and 3 Hawaiian damselflies. The area consists of 15,728 ac (6,365 ha) on the leeward side of the Koolau Mountains, on Federal, State, City and County of Honolulu, and privately-owned lands. This area includes the wet forest and shrubland, moisture regime and subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem, as well as the unique PCEs (e.g., perennial streams, slow reaches of streams or pools) for the Hawaiian damselflies. This critical habitat is essential for the conservation and recovery of these lowland wet species, because it provides suitable habitat and space for expansion of populations, and for reintroduction of individuals within their current and historical ranges. We have no information that would indicate any areas within these units should be removed based on economic, national security, or other relevant impacts, or new biological information.

(30) *Comment:* The Service does not provide justification for elimination of 11,549 ac (4,674 ha) of critical habitat. The proposed rule eliminates smaller habitat patches and undermines the 2003 proposal.

Our Response: The commenter did not provide clarification on the statement that 11,549 ac (4,674 ha) of critical habitat were eliminated in the August 2011 proposed rule. When 55,040 ac (22,274 ha) of critical habitat were designated for 99 Oahu plants in the June 17, 2003, final rule (68 FR 35950), the designation was based primarily on the specific localities where the species were known to occur, and focused on discrete areas occupied by the species at the time of listing. In this final rule, we have revised critical habitat for these 99 species based on new information on plant occurrences and a better understanding of the species' biological requirements. As a result, we are designating both occupied areas with physical or biological features essential to the species' conservation, and unoccupied areas that are essential to the species' conservation. We are able to do this with a designation of 42,804 ac (17,322 ha. Each of the areas provides critical habitat for multiple species based upon their shared habitat requirements, and takes into account any species-specific conservation needs, as appropriate. We have found that some of the areas designated as critical habitat in 2003 were not within the historical or current ranges of the species, and do not provide the PCEs essential to their conservation and recovery (i.e., these areas were not within the geographical area occupied at the time of the species' listing, and are not essential to their conservation). Accordingly, 17,325 ac (7,011 ha) designated in 2003 that fall into this category are not included in this critical habitat designation. The critical habitat designated in this rule is based on a biological and ecosystem-based approach, and provides essential habitat for the conservation and recovery of the 124 species included in this rule. Therefore, contrary to the commenter's assertion, the proposed rule does not undermine the 2003 final critical habitat designation for 99 Oahu plants.

(31) *Comment:* Given the extremely low population numbers of many of the species, it is not scientifically justifiable to eliminate habitat that supports individuals of the endangered plants. The proposed rule does not state that habitat that is known to support individuals is not being removed from critical habitat. Since the 2003 rule is based on occurrence data, the public is left to assume that some habitat that is known to support individuals will no longer be protected as critical habitat. We are concerned that eliminating critical habitat where plants currently occur will interfere with the recovery of these endangered species.

Our Response: The only designated critical habitat known to support individuals that is being removed from critical habitat in this rule are those areas covered by the Navy's INRMP for Lualualei. In this final rule, lands under Navy jurisdiction are exempted from critical habitat designation under section 4(a)(3)(B)(i) of the Act (a 2004 amendment to the Act). Section 4(a)(3)(B)(i) of the Act states 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. (See ''*Approved INRMPs*'', below, for further discussion).

(32) *Comment:* One commenter stated that ''the proposed rule expressly fails to provide any detailed narrative description of appropriate specificity to allow fair comment'' and cites page 76 FR 46511 at (12)(i) ''[Reserved for textual description of Unit 8]''. The commenter also stated that the proposed rule contains only generalized ''maps'' to indicate the areas proposed for designation, and this failure to provide sufficient information to allow fully informed public review and comment is arbitrary, capricious, and otherwise not in accordance with law.

Our Response: The section in brackets was reserved for the UTMs (mapping vertices) for unit delineation using GIS, which, until recently, were identified and published in the **Federal Register** in the final rule. However, on May 1, 2012 (USFWS 2012a, 77 FR 25611), the Service published revised regulations for requirements to publish textual descriptions of final critical habitat boundaries in the **Federal Register**. As of May 31, 2012, the Service no longer publishes the coordinates for critical habitat boundaries in the **Federal Register**. The coordinates on which each map is based are available to the public at the Federal eRulemaking portal (*http://www.regulations.gov*) using the docket number for the rulemaking (in this case, FWS–R1–ES–2010–0043), and at the web site of the field office responsible for the critical habitat (*http://www.fws.gov/pacificislands*) for the final critical habitat for the 124 Oahu species. The maps provided in the proposed rule identify the areas proposed for critical habitat designation. We believe these maps are adequate for regulatory purposes. The proposed rule also directs reviewers to contact the Service for further clarification on any part of the proposed rule, and provides contact information (76 FR 46362; August 2, 2011).

(33) *Comment:* The Service did not provide references. Unpublished databases are not references.

Our Response: Complete lists of references cited in the proposed rule (76 FR 46362; August 2, 2011) and in this final rule are available on the Internet at *http://www.regulations.gov*, and upon request from the Pacific Islands Fish and Wildlife Office (see **ADDRESSES**). This information was also presented in the proposed rule (76 FR 46470). One reference (Whistler 2008) was inadvertently omitted from those provided for the proposed rule, and is now available on our Web site. Under section 4(b)(1)(A) of the Act, we make a determination whether a species is endangered or threatened solely on the basis of the best scientific and commercial data available. Under section 4(b)(2), we designate, and make revisions to, critical habitat based on the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impact. In the

August 2, 2011, proposed rule and in this final rule, we used the best information available, including the State's Hawaii Biodiversity and Mapping Program database, the U.S. Army Environmental database from 2006 for Oahu, and the National Tropical Botanical Garden's plant databases. These databases include information from numerous sources including, but not limited to, expert field observations, museum collections, and published and unpublished literature, and are, in our opinion, sources of the best scientific data available.

(34) *Comment:* The damselflies should not be protected under the Act because flies do not need our protection. Residents should not have to fear punishment for removing pests from their homes and property.

Our Response: Native Hawaiian damselflies (in the genus *Megalagrion*) are endemic (i.e., unique and found nowhere else in the world) to Hawaii and are similar to dragonflies in appearance. There are 23 species of these damselflies, and they are found almost entirely in aquatic habitats (e.g., streams, lowland swamps, and marshes), although a few species are considered terrestrial or semi-terrestrial and found in moist, damp areas like rock faces, wet leaf litter, or water trapped in the leaves of native plants. Native Hawaiian damselflies are unlikely to be found in homes or developed property or landscaped areas because of their ecological requirements, and are not considered pests.

Summary of Changes From Proposed Rule

We fully considered comments from the public and peer reviewers on the proposed rule to develop this final listing for 23 species and critical habitat designation for 124 species from Oahu. This final rule incorporates the following substantive changes to our proposed listing and designation, based on the comments we received:

(1) We removed 193 ac (78 ha) from proposed Oahu—Lowland Dry—Unit 8 to exclude areas that are not essential to the conservation of the species, based on additional, refined information gained from field visits. We observed that changes in land use had occurred in certain areas within the proposed critical habitat that would preclude these areas from supporting the primary constituent elements, and that these areas would not support viable populations of the 17 plants for which it was proposed critical habitat. Oahu—Lowland Dry—Unit 8 now encompasses 99 ac (40 ha) essential to the conservation of 16 lowland dry plant species.

(2) We made revisions to the demographic status and distribution of 11 species of plants (*Cyanea lanceolata, C. purpurellifolia, Cyrtandra sessilis, C. waiolani, Doryopteris takeuchii, Korthalsella degeneri, Melicope hiiakae, M. makahae, Pleomele forbesii, Psychotria hexandra* ssp. *oahuensis,* and *Zanthoxylum oahuense*) by correcting their current locations or numbers of individuals in Description of the 23 Species, based on comments we received.

(3) We made revisions to the primary constituent elements (PCEs) for three plants, based on comments we received, by removing the lowland mesic ecosystem from the PCEs for *Cyrtandra waiolani* and the lowland wet ecosystem from the PCEs for *Melicope makahae* and *Pleomele forbesii.* Accordingly, we removed *Cyrtandra waiolani* from the list of plants in Oahu—Lowland Mesic—Units 4, 5, 6, and 7, and we removed *Pleomele forbesii* and *Melicope makahae* from the list of plants in Oahu—Lowland Wet—Units 1, 2, 3, 4, and 5, because a peer reviewer recommended that these ecosystems were inappropriate for the species. We also removed *Pleomele forbesii* from the list of plants in Oahu—Lowland Dry—Units 8, 9, 10, and 11 because the elevation of these four units is too low to have the ability to provide habitat for this species.

(4) We revised the unit boundaries we proposed Oahu—Lowland Wet—Unit 5, Oahu—Lowland Wet—Unit 13, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, Oahu—Wet Cliff—Unit 2, and Oahu—Wet Cliff—Unit 5, which resulted in acreage reductions in these units as follows:

Oahu—Lowland Wet—Unit 5: Reduced by 2 ac (1 ha)
Oahu—Lowland Wet—Unit 13: Reduced by 86 ac (35 ha)
Oahu—Dry Cliff—Unit 4: Reduced by 84 ac (34 ha)
Oahu—Dry Cliff—Unit 6: Reduced by 106 ac (43 ha))
Oahu—Dry Cliff—Unit 7: Reduced by 102 ac (42 ha)) (combined 7a and 7b)
Oahu—Wet Cliff—Unit 2: Reduced by 4 ac (2 ha))
Oahu—Wet Cliff—Unit 5: Reduced by 12 ac (5 ha))

These revisions were based on comments indicating that (a) Changes in land use had occurred within the proposed critical habitat units that would preclude certain areas from supporting the primary constituent elements; (b) adjustments were needed for the adjoining borders of wet cliff and lowland wet ecosystem areas; (c) the areas in question were not essential to the conservation of the species; or (d) portions of the unit were exempted from critical habitat under section 4(a)(3)(B)(i) of the Act.

(5) We are not designating lands within proposed Oahu—Dry Cliff—Unit 5, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, and Oahu—Lowland Dry—Unit 5 as critical habitat under section 4(a)(3)(B)(i) of the Act.

(6) Following publication of our proposed rule in August 2011, we found that 21 plants (*Bidens amplectens, Chamaesyce celastroides* var. *kaenana, Cyrtandra dentata, Dubautia herbstobatae, Eragrostis fosbergii, Euphorbia haeleeleana, Gouania vitifolia, Hibiscus brackenridgei, Isodendrion laurifolium, I. pyrifolium, Kadua degeneri, Korthalsella degeneri, Melanthera tenuifolia, Melicope makahae, Peucedanum sandwicense, Phyllostegia kaalaensis, Schiedea kealiae, S. obovata, S. trinervis, Silene lanceolata,* and *Tetramolopium filiforme*) were inadvertently omitted from the discussion of species for which critical habitat was initially proposed on Navy lands. We also determined that four previously listed plants (*Hesperomannia arbuscula, Melicope pallida, Stenogyne kanehoana,* and *Urera kaalae*) were inadvertently included in this discussion (i.e., critical habitat was proposed for these species when it should not have been). Although critical habitat is exempted for the above 21 species within one or more of the 10 units that overlap Navy lands, none of these species presently occupy Navy lands.

(7) We adjusted critical habitat acreages on Table 7A and Table 7B to account for changes in unit areas and to correct arithmetical errors. This resulted in the following specific changes:

Oahu—Coastal—Unit 9: reduced by 4 ac (2 ha)
Oahu—Coastal—Unit 13: Reduced by 1 ac (0 ha)
Oahu—Coastal—Unit 15: Reduced by 1 ac (0 ha)
Oahu—Lowland Dry—Unit 9: Reduced by 4 ac (2 ha)
Oahu—Lowland Mesic—Unit 1: Reduced by 1 ac (0 ha)
Oahu—Lowland Mesic—Unit 7: Reduced by 6 ac (3 ha)
Oahu—Lowland Wet—Unit 7: Reduced by 3 ac (1 ha)

(8) We added ''coral outcrop substrate'' to the PCEs for *Chamaesyce skottsbergii* var. *skottsbergii.*

(9) We added *Plumbago, Sida,* and *Waltheria* to the list of understory plants in the lowland dry ecosystem.

(10) We removed *Cyrtandra waiolani* from the list of plants in Oahu—Lowland Mesic—Units 4, 5, 6, and 7, as a peer reviewer recommended that this ecosystem was inappropriate for the species.

Summary of Factors Affecting the 23 Species

Section 4 of the Act 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 mechanism; 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. 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 because we have no information on primary threats to the species that would fall under this category.

Ecosystem Approach

Each of the 23 species in this final 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., nonnative 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 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 and difficult to survey in a comprehensive manner, and the target species are exceptionally uncommon).

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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 (LD)			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 waiolani	LW	X	X						X	X		S	X	LN
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			X	
Melicope hiiakae	LW	X	X					H	X	X	R		X	LN, T
Melicope makahae	LM, DC	X	X	X				L, RF	X	X		BTB	X	NR
Platydesma cornuta var. *cornuta*	LW	X	X					H	X	X			X	LN
Platydesma cornuta var. *decurrens*	LM, DC	X	X	X				L, RF	X	X			X	
Pleomele forbesii	LD, LM, 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

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

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Ecosystem-Scale Threats That Affect the 23 Species

The following constitutes a list of ecosystem-scale threats that affect the 23 species in all of the seven ecosystems on Oahu:

(1) Foraging and trampling of native plants by goats (*Capra hircus*) and pigs (*Sus scrofa*), 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 by 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, 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 above. 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 1985, pp. 180, 218, 228–229; Vitousek *et al.* 1987 in Cuddihy and Stone 1990, p. 74).

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 impacted by threats of 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 facing threats by nonnative ungulates (Perlman 2007a, in litt.).

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 23 species 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 (5) 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 (plant 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 in this final rule. 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 final 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-to-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-to-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 occurs more rapidly 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 20 plant species in this final rule by modifying or destroying their terrestrial habitat. Please refer to the proposed rule (76 FR 46362; August 2,

2011) for a list of nonnative plants and a discussion of their specific negative effects on the 20 plant species.

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 the habitats of six of the plant species in this final rule, based on information identifying fire as a threat to a particular species at a particular location: *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 designated as critical habitat in this final 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 2005, in litt.). In 2006, a fire at Kaena Point State Park burned 60 ac (24 ha), including portions of two units designated as critical habitat in this rule, 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 4 ac (2 ha) at Makua Cave (at the mouth of Makua Valley). Both of these fires burned in 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'Antonio 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 final 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 ''S*pecific Nonnative Plant Species Impacts*,'' in our August 2, 2011, proposed rule (76 FR 46362)) (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 in this final 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 native forest trees were destroyed (Perlman 1992, in litt., pp. 1–9), which opened the canopy and facilitated the invasion of nonnative plants (Kitayama and Mueller-Dombois 1995, p. 671). Historically (prior to the introduction of nonnative, invasive plants to the Hawaiian Islands), it is likely that areas affected by hurricanes would eventually have been repopulated by native plants. However, competition with nonnative plants is exacerbated by hurricanes, and represents a threat to each of the 7 ecosystems and the 20 plant species addressed in this final rule, as described in ''*Specific Nonnative Plant Species Impacts,*'' in our August 2, 2011, proposed rule (76 FR 46362). 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 (from Barber's Point or Kalaeloa, to Kaena Point) (Blake *et al.* 2007, p. 20), where the endangered plant *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 final rule, 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 (63 to 76 cm) 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 (7.6 cm) per hour or more, and sometimes may reach nearly 40 in (100 cm) 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 final 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 face threats from 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 (2006c, in litt.) and the PEP Program (2006, p. 51) suggest that flooding is a likely threat to two plant species included in this final 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 vulnerability 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) and 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 (300 m)) marshlands and wetlands are considered, it is estimated that 30 percent have been converted to agricultural and urban development (Kosaka 1990, in litt.). 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, in litt.). 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 8 percent in the past 11 years, along with the associated increased demands on limited land and water resources (Hawaii Department of Business, Economic Development and Tourism (HDBEDT) 2012). 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 2 or 3 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 1,000 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 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 range on Oahu. This loss of stream habitat may have contributed to the extirpation of populations of the three damselflies from lower elevations (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, which is more than 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 more than 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 (Devick 1995, pers. comm.). 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 habitat 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 historical 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; Polhemus 2008, in litt.).

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), a vulnerability 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 final rule, or the 23 species that are associated with those ecosystems. Based on the best available information, climate change impacts could lead to the decline or loss of native species that comprise the communities in which the 23 species occur (Pounds *et al.* 1999, pp. 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 (Polhemus 2008, in litt.). 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 in this final rule 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 their habitat, 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 final 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 habitats of the blackline, crimson, and oceanic Hawaiian damselflies also face threats from 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 and their habitats in this final rule 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 19 of the 20 plant species listed in this final rule, 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 listed in this final rule, 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 the habitats of all 20 plant species being addressed in this final 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 is a threat to, the 20 plant species addressed here.

The threat from fire to the habitats of six species in this final 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 the habitats of 7 of the 20 plant species addressed in this final 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 are a threat to the habitats of the three Hawaiian damselfly species in this final rule, because they alter and cause direct damage to streams (Polhemus 1993, pp. 86–87). These habitat impacts can be particularly devastating to the seven plant species and three Hawaiian damselfly species addressed in this final 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 to drive 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 the habitats of 10 of the species in this final rule (*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 is a threat to all three damselfly species' habitats by desiccation 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 three damselfly's habitats. Twelve percent of the freshwater habitat in Hawaii has already been lost, and 30 percent of all coastal plain wetlands in Hawaii has been lost to agriculture and urban development (Kosaka 1990, in litt.). 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 habitats of the 23 species addressed in this final 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 final rule that are 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 final rule that are 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 pose a threat to the following 19 of the 20 plant species in this final rule 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), *Korthalsella degeneri* (feral pigs and goats), *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* ssp. *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.* The fern *Doryopteris takeuchii* grows on the slopes of Diamond Head Crater, an area that is not affected by introduced ungulates.

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 is a threat to 5 of the 20 plant species addressed in this final rule (*Cyanea calycina, C. lanceolata, Cyrtandra gracilis, Melicope hiiakae,* and *Psychotria hexandra* ssp. *oahuensis;* see Table 2), which have fleshy fruits. 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 in this final rule, 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.

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*) (Englund 2000, in litt.). 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 1985, 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). They have a negatively correlated pattern of occurrence with native damselflies, including the three species described in this final rule (Polhemus 2012, in litt.).

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 11 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 face the threat of predation by ants (Borror *et al.* 1989, pp. 737–741).

Slugs

Predation by nonnative slugs is 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 final 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* (Mehrhoff 1995, in litt.; 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,* based on laboratory studies (U.S. Army Garrison 2005a, p. 3–51). Research investigating slug herbivory and control methods shows that slug impacts on *Cyanea* spp. seedlings result in up to 80 percent seedling mortality (U.S. Army Garrison 2005a, p. 3–51). Direct evidence of slug predation has been reported for *Cyanea calycina* and *Cyrtandra kaulantha* in the wild (see above). Although we do not have direct evidence of slug predation on the species of *Cyanea* and *Cyrtandra* that are addressed in this final rule, research and field observations indicate that predation by slugs is a threat to species of *Cyanea* and *Cyrtandra* in the wild, the five species have similar life forms (e.g., fleshy stems, fruit, and leaves) and occur in habitat similar to that of the species that have been impacted by slug herbivory in the wild and under laboratory conditions, and slugs are found in the ecosystems on Oahu in which these plants occur. It is therefore reasonable to assume *Cyanea lanceolata* and *C. purpurellifolia,* and *Cyrtandra gracilis, C. sessilis,* and *C. waiolani* are 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, pp. 38–39; 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). Black twig borer damage is typically observed on plants in mesic or dry forests or shrublands, and not usually observed on plants in wet forest or shrubland (Lau 2012, in litt.). 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 threat to *M. makahae,* the only species of *Melicope* that occurs in mesic forest and shrubland.

Two-Spotted Leafhopper

The effects of predation by the two-spotted leafhopper have been observed on three plant species included in this final 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 (1,200 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 (Fukada 2007, pers. comm.).

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 papuana*) 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 (Polhemus 2008b, in litt.). 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 760 m) in elevation (Polhemus 2008a, in litt.; 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 final 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 19 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 13 of the 20 plant species in this final 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 (1,150 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 final rule to be facing the threat of 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 face the threat of predation by bullfrogs.

D. The Inadequacy of Existing Regulatory Mechanisms

Feral Ungulates

Nonnative ungulates pose a major ongoing threat to 19 of the 20 plant species 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; HDLNR 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). Approximately 23 percent (10,168 ac (4,119 ha)) of the critical habitat being designated in this final rule is in State hunting areas. 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. However, the State game animal regulations are not designed nor intended to provide habitat protection, and there are no other regulations designed to address habitat protection from ungulates.

Stream Flow

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 Hawaii Department of Land and Natural Resources (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 (Hawaii Commission on Water Resource Management 2009c). 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 (Hawaii Commission on Water Resource Management 2009c). Therefore, we find that the existing State regulations are inadequate to maintain stream flow year round for the different life stages of the three damselflies. These threats are ongoing and are expected to continue into the future.

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 2009a). Since 2009, State funding for HISC has been cut by approximately 50 percent (total funding dropped from $4 million in FY 2009 to $2 million in FY 2010, and to $1.8 mil in FY 2011 (Atwood 2012, in litt.)). Congressional earmarks made up some of the shortfall in State funding in 2010 and into 2011. These funds supported ground crew staff that would have been laid off due to the shortfall in State funding (Clark 2012, in litt.). Currently (in 2012) the HISC budget is relatively flat (i.e., State funding is equal to funding provided in 2009). Current positions supported by HISC are fewer than those supported in 2009; most of the positions have been lost through attrition and have not been refilled (Atwood 2012, in litt.; Clark 2012, in litt.). In addition, HISC funds fewer projects and provides fewer services (Atwood 2012, in litt.; Clark 2012, in litt.) than in 2009 and earlier. Many projects (such as invasive species and biological control research) that were previously funded by HISC are receiving negligible HISC funding or remain unfunded (Atwood 2012, in litt.; Clark 2012, in litt.).

Nonnative Aquatic Species—The importation of nondomestic 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 nondomestic animals that are prohibited from entry, animals with entry restrictions, and 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). Further, 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 (Cravalho and Wilson 2009, in litt.).

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 (TNCH) 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 final 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 (Martin 2007, in litt.).

On the basis of the above information, existing State and Federal regulatory mechanisms are not adequately preventing the introduction of nonnative species into Hawaii via interstate and international mechanisms, or via intrastate movement of nonnative species between islands and watersheds in Hawaii. Therefore, State and Federal regulatory mechanisms do not adequately protect the 23 species being addressed in this final rule from the threat of new introductions of nonnative species or 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. The impacts from these introduced threats are ongoing and are expected to continue in the foreseeable future.

Summary of Inadequacy of Existing Regulatory Mechanisms

The State Water Code does not provide for permanent or minimum IFS for the protection of aquatic ecosystems upon which the three damselfly species in this final rule depend, and does not contain a regulatory mechanism for identifying and protecting damselfly habitat (Factor A). Existing State and Federal regulatory mechanisms are not preventing the introduction into Hawaii of nonnative species 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 final rule. Because these 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 plant species experiences threats from habitat degradation and loss by nonnative plants (Factor A), and 19 of the 20 plants experience threats from nonnative animals (Factor A and Factor C). The three damselflies experience threats from habitat degradation and loss by stream channeling, conversion, and similar activities (Factor A), and by predation by nonnative fish and ants (Factor C). Therefore, the inadequacy of the regulatory mechanisms to address stream flow management and nonnative species is a threat to all 23 species.

E. Other Natural or Manmade Factors Affecting Their Continued Existence

Other factors that pose threats to 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 functionally unisexual plants 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 final rule face the threat of 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 small population size to be a threat to these species for the following reasons:

- *Cyanea purpurellifolia* is susceptible to reduced reproductive vigor due to the low number (20) of individuals remaining (DLNR 2005b, p. 2). Although facing severe threats from 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 2007, p. 16).
- The only known wild populations of *Cyrtandra kaulantha* and *Psychotria hexandra* ssp. *oahuensis* are facing imminent threats from flooding, landslides, and rock falls because of their locations in steep gulches (PEP 2006, p. 46, 51; PEP 2007, p. 25).
- The last confirmed observation of *Cyrtandra waiolani* in the wild was approximately 40 years ago. The identification of a possible wild individual of *C. waiolani* in 2005 was confirmed not to be this species. In addition, there are no tissues, propagules, or seeds in storage or propagation that have positively been identified (PEP 2007, p. 19; Bakutis 2008, in litt.; Lau 2011, in litt.).
- *Melicope hiiakae* is susceptible to reduced reproductive vigor due to the lack of pollination and seed predation (NTBG Report 2007b, p. 4; Perlman, 2007b, in litt.).
- *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 (Bakutis 2008, in litt.).
- 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 (Garnett and Obata 1999, in litt.).

The blackline, crimson, and oceanic Hawaiian damselflies face the threat of 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 (*Megalagrion pacificum*), an endangered species (75 FR 35990; June 24, 2010), and the orangeblack Hawaiian damselfly, a candidate species (76 FR 66370; October 26, 2011). 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 pose threats to *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 (TNCH 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 2001, in litt.). 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 2008). This type of activity has been observed with other native species (Wood 2001, in litt.; Hawaii Rare Plant Restoration Group (HRPRG) 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 (HRPRG 2007, p. 2).

Loss of Host Plants and Loss of Regeneration

One species in this final rule, *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; Lau 2001, in litt.). 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 (fewer than 50) individuals to be serious and ongoing threat to at least nine plant species in this final 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 final 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.

Determination

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 introduced ungulates and nonnative plants. Six of these species (*Bidens amplectens, Cyanea calycina, Doryopteris takeuchii, Korthalsella degeneri, Pleomele forbesii*, and *Pteralyxia macrocarpa*) experience threats from 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) experience threats from 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 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 experience threats from 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. Based on our analysis, we have no

reason to believe that population trends for any of the species addressed in this final rule will improve, nor will the effects of current threats acting on the species be ameliorated in the foreseeable future. Therefore, on the basis of the best available scientific and commercial information, we are listing the following 23 species as endangered in accordance with section 3(6) of the Act: *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, Pterlyxia macrocarpa, Tetraplasandra lydgatei*, and *Zanthoxylum oahuense*; and the blackline Hawaiian damselfly, crimson Hawaiian damselfly, and oceanic Hawaiian damselfly.

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 in this final 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' entire range and are not restricted to any particular portion of that range. Accordingly, our assessment and 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 at the same time or 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 **ADDRESSES**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, nongovernmental 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.

Funding for recovery actions are available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, under section 6 of the Act, the State of Hawaii will be eligible for Federal funds to implement management actions that promote the protection and recovery of the 23 species in this rule. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants*.

Please let us know if you are interested in participating in recovery efforts for these listed species. Additionally, we invite you to submit any new information on these species whenever it becomes available and any information you may have for recovery planning purposes (see **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 and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(1) of the Act mandates that all Federal agencies shall utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of endangered and threatened species listed under section 4 of the Act. Section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or result in destruction or adverse modification of critical habitat. If a Federal action may affect the continued existence of a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

For the 23 plants and animals listed as endangered in this final 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 (33 U.S.C. 1251 *et seq.*), Partners for Fish and Wildlife Program, and DOD construction activities related to training or other military missions.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered wildlife and plants.

The prohibitions, codified at 50 CFR 17.21 for wildlife and 17.61 for plants, apply. For listed wildlife species, 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 or foreign 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 endangered or threatened wildlife and plant species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22 and 17.62 for endangered 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 and 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 NE. 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 listing on proposed and ongoing activities within the range of a listed species. 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, or oceanic Hawaiian damselfly is known to occur.

(5) Unauthorized discharge of chemicals or fill material into any waters in which the blackline, crimson, or oceanic Hawaiian damselfly is 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 **ADDRESSES**). Requests for copies of the regulations concerning listed species 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 87232–4181 (telephone 503–231–6158; facsimile 503–231–6243).

The State of Hawaii's endangered species law (State of Hawaii 2009) is automatically invoked when a species is listed, and provides 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 (State of Hawaii 2009). Funds for these activities could be made available under section 6 of the Act (Cooperation with the States). Thus, Federal protection afforded to listed species is reinforced and supplemented by protection under State law.

Taxonomic Name Changes for Nine 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 Barber's 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, and *C. skottsbergii* var. *audens,* the range of which includes only Molokai.

We are aware of Steinman and Porter's 2002 (p. 473) molecular data for classification of Euphorbieae and the analysis of Bruyns *et al.* (2006, pp. 416–417), who found that *Chamaesyce* is nested among species of *Euphorbia.* Changing the names for the endangered Oahu plants *Chamaesyce celastroides* var. *kaenana, C. deppeana, C. herbstii, C. kuwaleana, C. rockii* and *C. skottsbergii* var. *skottsbergii* at 50 CFR 17.12 and at 50 CFR 17.99(j) would require a separate amendment to the CFR, not only for the Hawaiian species listings, but for all previously listed species nationwide. This amendment requires a separate notice and opportunity for public comment, and although we are unable to address this change in this final rule, we will initiate proposed taxonomic name changes for these five endangered plants in a future proposed rule.

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 and Herbst (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, in accordance with the references cited above, we are revising the List of Endangered and Threatened Plants at 50 CFR 17.12 (see Table 3). In addition, we made editorial revisions to a limited number of units and species descriptions in 50 CFR 17.99(a)(1) and (b) (Kauai), 50 CFR 17.99(e)(1) and (f) (Maui), and 50 CFR 17.99(g) and (h) (Northwestern Hawaiian Islands) to adopt the taxonomic revisions.

TABLE 3—NAME CHANGES FOR 9 LISTED ENDANGERED HAWAIIAN PLANTS

Listing	Currently listed name	Accepted name 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 the 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 the 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 to use and 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 be otherwise 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) 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 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 for the necessary life cycle needs of the species (areas on which are found the physical or biological features 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. We are currently not aware of any climate change information specific to the habitat of any of the species addressed in this rule that would indicate what areas may become important to the species in the future. Therefore, we were unable to determine what additional areas, if any, may be appropriate to include in the critical habitat designation for these 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 plants (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 25 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 listed in this rule 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 final 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 will be beneficial, and have determined the designation of critical habitat is prudent for each of the species addressed in this final 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 listed listing in this final 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 will be beneficial and there is no evidence that the designation of critical habitat will 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, 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 ''Taxonomic Name Changes for Nine 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 listed in this final 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.

Revision of Critical Habitat for 99 Oahu Plants and Designation for 2 Previously-Listed Plants

This section discusses the revision of currently designated critical habitat for 99 Oahu plant species, based on new information. This section also provides a brief description of the two additional plant species (*Achyranthes splendens* var. *rotundata* and *Chamaesyce skottsbergii* var. *skottsbergii*) that were previously listed without designation of critical habitat, for which we are now designating critical habitat. This information represents the best scientific and commercial information available.

Revision of Critical Habitat for 99 Oahu Plants

Under section 4(a)(3)(A)(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; June 17, 2003). Based on new information and scientific data available since 2003, we have revised critical habitat for these 99 plant species. In addition, since critical habitat was designated in 2003, we have learned that many native Hawaiian plants and animals can thrive when reintroduced into historical habitats, when threats are effectively managed. For this reason, we believe it is important to designate unoccupied habitat when it is essential for the recovery of the species. Approximately 93 percent of the area designated as critical habitat in this rule overlaps with the area designated in the 2003 final critical habitat rule. In some areas, the footprint of the 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 reducing critical habitat, based on updated information on the historical ranges of certain species. The revision simply correlates to 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, which are essential for their conservation. The 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 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 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 the 99 Plant Species With Revised Critical Habitat and the 2 Previously-Listed Plant Species

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 35950; June 17, 2003). 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 Barber's 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). *C. agrimonioides* var. *laysanensis* may be extinct. At the time we designated critical habitat in 2003, *C. agrimoniodies* 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 (Lau 2006b, in litt.; Perlman 2006, pers. comm.; 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 known only from the Ewa Plains on southwestern Oahu in the vicinity of Barber's 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). Surveys conducted between 1983 and 1984 in the vicinity of the former Barber's Point Naval Air Station indicated there was a total of approximately 5,000 plants (HINHP 1991; USFWS 1993, pp. 13–15). However, surveys conducted a decade later located only several hundred plants in the same location (USFWS 1993, pp. 13–15). Currently, this species is found in 2 occurrences in the lowland dry ecosystem on the Ewa Plain in southwestern Oahu, totaling approximately 200 wild individuals and 600 outplanted individuals (Guinther and Withrow 2008, pp. 6, 9–10; Whistler 2008, pp. 7–9; U.S. Navy *et al.* 2012, pp. 19–20).

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, *C. 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 (haha), a shrub in the bellflower family (Campanulaceae), is endemic to the Koolau Mountains of Oahu (Lammers 1999, pp. 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 in the lowland mesic and lowland wet ecosystems (U.S. Army 2006; TNC 2007; HBMP 2008). The last known wild individual in Kupaua died in 2005. Propagules are in cultivation and will be outplanted in protected areas (PEP 2008, p. 19; Lau 2011, in litt.).

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, *C. superba* ssp. *regina* (southern Koolau Mountains) and *C. superba* ssp. *superba* (northern Waianae Mountains). The last known wild individual of *C. 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 survive (TNC 2007; HBMP 2008). *Cyanea superba* ssp. *regina* has not been observed since the 1930s (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 4 outplanted occurrences totaling 37 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 (Wagner *et al.* 1999, pp. 1,421–1,423). This species is known from two varieties, *C. pennatiformis* var. *bryanii* (Laysan) and *C. pennatiformis* var. *pennatiformis* (Kauai, Oahu, east Maui, and Hawaii). 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, and 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 (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 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 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 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 Hawaii (Bates 1999, pp. 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 (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 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 (Motley 2006, pers. comm.; 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 Garrison 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 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; PEP 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), 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 (Marsileaceae), 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; Chau 2009, in litt.).

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 Garrison 2005b, 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 Garrison 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 2006; U.S. Army Garrison 2006, 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 277 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 2006; U.S. Army Garrison 2006, 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 Garrison 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, and *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 Waianae Mountains. Currently, all four wild individuals of *P. parviflora* var. *lydgatei* in the Waianae Mountains are extirpated; however, 100 individuals have been outplanted (TNCH 1997, p. A–10; Sailer 2006, in litt.). *Phyllostegia parviflora* var. *parviflora* is known from approximately 100 individuals in the lowland wet and wet cliff ecosystems in the Koolau Mountains (NTBG 2009).

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 (Wagner *et al.* 1999, pp. 1,054–1,055). *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 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 (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 200a; U.S. Army Garrison 2006, 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 the lowland wet and wet cliff ecosystems 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 coastal and lowland dry ecosystems in the Waianae Mountains (U.S. Army 2006; TNC 2007; 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; Wagner *et al.* 2005). 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 2006; 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 2006; U.S. Army Garrison 2006, 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 2006; U.S. Army Garrison 2005b, 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 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). 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 (Sailer 2007, pers. comm.).

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 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. 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 Garrison 2005b, pp. 16–155—16–157; U.S. Army 2006; 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 approximately 250 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 Garrison 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 Garrison 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. 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 Garrison 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 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 databases housed at NTBG;
- Oahu map of important habitat for the recovery of plants protected under the Act (Service 1999, p. F–7);
- Geographic Information System (GIS) map layer of habitat essential to the recovery of Hawaiian plants as determined by the Hawaii and Pacific Plant Recovery Coordinating Committee (HPPRCC 1998);
- Geodatabase feature dataset for Oahu soils (NRCS 2007);
- 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 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 (2012);
- Final critical habitat designation for listed plant species on the island of Oahu (68 FR 35950, June 17, 2003);
- The FWS report (June 2012) ''Recovery Needs and Strategy for 'Akoko'''';
- Recent biological surveys and reports; and
- Discussions with qualified individuals familiar with these species and ecosystems (HBMP 2008; TNC 2007; NTBG 2007; PEP 2007; Polhemus 2008, pers. comm.; Bakutis, 2006, in litt.).

Physical or Biological Features

In accordance with section 3(5)(A)(i) and 4(b)(1)(A) of the Act and regulations at 50 CFR 424.12, in determining which areas within the geographical area occupied at the time of listing to designate 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 necessary 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, or rearing (or development) of offspring; and

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

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 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. 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 addition, the Recovery Plan for the Oahu Plants (Service 1998, p. vii) identifies several actions needed to recover these species, including expanding existing wild populations and reestablishing wild populations within the historic range. In accordance with the recovery plan, we have determined that designating certain unoccupied habitat is essential to the conservation of the species and that designation limited to occupied areas would be inadequate to ensure the conservation of the species. The physical or biological features for occupied areas, in conjunction with the unoccupied areas needed to expand and reestablish wild populations within the historical 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.

In 2003, the physical or biological features for each plant species were defined on the basis of 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). However, 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. In this final rule, the physical or biological features have been categorized into the ecosystem types on which these species depend. They have also been more precisely identified, and now include elevation, precipitation, substrate, canopy, subcanopy, and understory characteristics.

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, provide for a species' life-history processes and are essential to the conservation of the species. In this rule, 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 (in the case of the three damselflies), we consider the physical or biological features present in the ecosystems described in this rule to provide the necessary PCEs for each species. 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 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 in this rule 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 rule, and each species identified in this rule requires the physical or biological features for each ecosystem in which that species occurs, as noted in Table 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 ability to support viable populations of 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 4. Note that the PCEs identified in Table 5 for each species are directly related to the physical or biological features presented in detail in Table 4; thus, both Tables 4 and 5 must be read together to fully describe all of the PCEs for each species.

TABLE 4—PHYSICAL OR BIOLOGICAL FEATURES IN EACH ECOSYSTEM

[Read in association with table 5]

Ecosystem	Elevation	Annual precipitation	Substrate	Capable of Supporting Viable Populations of Associated Native Plant Genera		
				Canopy	Subcanopy	Understory
Physical or Biological Features						
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, Plumbago, Sicyos, Sida, Waltheria*
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 6,600 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 plant 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, and *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		
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	
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. *grimesiana.*			X	X				
Cyanea grimesiana ssp. *obatae.*			X	X		X		
Cyanea humboldtiana				X			X	
Cyanea koolauensis				X				
Cyanea lanceolata			X	X				
Cyanea longiflora			X					
Cyanea pinnatifida			X					
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		
Cyrtandra gracilis				X				
Cyrtandra kaulantha				X			X	
Cyrtandra polyantha			X	X				
Cyrtandra sessilis				X			X	
Cyrtandra subumbellata				X			X	
Cyrtandra viridiflora				X			X	
Cyrtandra waiolani				X				
Delissea subcordata			X					
Diellia erecta			X					
Diellia falcata			X			X		
Diellia unisora			X			X		
Diplazium molokaiense			X	X				
Doryopteris takeuchii		X						
Dubautia herbstobatae			X			X		
Eragrostis fosbergii			X			X		
Eugenia koolauensis			X					
Euphorbia haeleeleana		X	X					
Flueggea neowawraea			X			X		
Gardenia mannii			X	X				
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		
Isodendrion longifolium			X	X				
Isodendrion pyrifolium		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—Continued

	Coastal	Lowland dry	Lowland mesic	Lowland wet	Montane wet	Dry cliff	Wet cliff	Unique PCEs for species
Kadua coriacea			X					
Kadua degeneri			X			X		
Kadua parvula			X			X		
Korthalsella degeneri						X		host plants *Sapindus oahuensis* and *Nestegis sandwicensis*.
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	
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		
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	
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				
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		
Psychotria hexandra ssp. *oahuensis*.				X			X	
Pteralyxia macrocarpa			X	X		X	X	
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						
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					
Spermolepis hawaiiensis		X				X		
Stenogyne kanehoana			X					
Tetramolopium filiforme						X		
Tetramolopium lepidotum ssp. *lepidotum*.			X			X		
Tetraplasandra gymnocarpa			X	X			X	
Tetraplasandra lydgatei			X					
Trematolobelia singularis				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—Continued

	Coastal	Lowland dry	Lowland mesic	Lowland wet	Montane wet	Dry cliff	Wet cliff	Unique PCEs for species
Urera kaalae			X	X				
Vigna o-wahuensis	X							
Viola chamissoniana ssp. *chamissoniana.*			X			X		
Viola oahuensis				X			X	
Zanthoxylum oahuense				X				
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 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, 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 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 3,300 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, the physical or biological features that characterize the lowland wet ecosystem are the physical and biological features required by *Z. oahuense.*

As another example, Table 5 tells us that 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 designating critical habitat in this rule.

Criteria Used To Identify Critical Habitat Boundaries

We considered several factors in the selection of specific boundaries for critical habitat for these 124 species. We are designating 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 rule does not form a single contiguous area, the ecosystems are divided into geographic units. The 7 ecosystem areas are divided into 62 critical habitat units.

The designated 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 occupying 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 that occur 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 designated, 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.

Based on the best information available at this time, we have determined that the current size and distribution of the extant populations are not sufficient to expect a reasonable probability of long-term survival and recovery. For each of the 99 plant species for which critical habitat was designated in 2003 (and for which critical habitat is being revised in this rule), the overall recovery strategy outlined in approved recovery plans includes: (1) Stabilizing existing wild populations; (2) protection and management of habitat; (3) enhancement of existing small populations and reestablishment of new populations with historic range; and (4) research on species biology and ecology (Service 1994, 1995a, 1995b, 1996a, 1996b, 1996d, 1997, 1998a, 1998b, 1999). The overall recovery goal in the short-term is a successful population that can carry on basic life history processes, such as establishment, reproduction, and dispersal, at a level where the probability of extinction is low. In the long-term, the species and its populations should be at a reduced risk of extinction and be adaptable to environmental change. In general, longlived woody perennial species would be expected to be viable at population levels of 50 to 250 individuals or more per population, while short-lived perennial species would be viable at levels of 1,500 to 2,500 individuals or more per population. In general, the larger the number of populations and the larger the size of each population, the lower the probability of extinction (Meffe and Carroll 1996, pp. 218–219, Raup 1991, pp. 124, 126–127). The draft recovery plan for *Chamaesyce skottsbergii* var. *skottsbergii* and *Achranthes splendens* var. rotundata identifies the augmentation of existing populations and reestablishing both species in areas where they are no longer extant (Service 1994, p. 58) as a recovery strategy. The survival and recovery potential for the three Hawaiian damselflies for which critical habitat is being designated is compromised by a combination of threats exacerbated by their inherent vulnerability to extinction. Each of these species faces threats from limited numbers (less than 20 populations exist for each species), and susceptibility to stochastic events such as drought and flooding. The key to survival and recovery of these species relies on the effective use of measures to keep nonnative species, particularly fish, out of currently occupied habitats, and the reestablishment of populations within their historic range to reduce the possibility of extinction due to stochastic events or other threats. Protecting and properly managing occupied and unoccupied critical habitat areas is necessary to provide for the persistence of viable populations of these species.

In summary, the long-term survival and conservation of these species requires the designation of sufficient critical habitat units with suitable habitat. Some of the habitat being designated in this final rule is currently not known to be occupied. However, to recover these species, it is essential to conserve suitable habitat in both occupied and unoccupied units, which will in turn allow for the establishment of additional populations through natural recruitment or managed reintroductions. Establishment of these additional populations will increase the likelihood that the species will survive and recover in the face of normal and stochastic events (e.g., hurricanes, fire, and nonnative species introductions) (Mangel and Tier 1994, p. 612; Pimm *et al.* 1998, p. 777; Stacey and Taper 1992, p. 27). In this regard, the designation of critical habitat limited to the geographic areas occupied by the species at the time of listing would be insufficient to achieve these recovery objectives.

For seven of the plant species reported from Oahu and other Hawaiian Islands, *Adenophorus periens* (extant on Kauai, Molokai, and Hawaii), *Cyperus pennatiformis* (formerly *Mariscus pennatiformis*) (extant on Maui and Kauai), *Diplazium molokaiense* (extant on Maui), *Isodendrion pyrifolium* (extant on Hawaii), Kadua coriacea (formerly *Hedyotis coriacea*) extant on Maui and Kauai), *Platanthera holochila* (extant on Kauai, Molokai, and Maui), and *Vigna o-wahuensis* (extant on Hawaii, Kahoolawe, Lanai, Molokai, and Maui), we are designating 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 designating potentially unoccupied areas only. 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 individually and collectively provide for the conservation of the 124 species addressed in this rule. While all 3 damselfly species are historically known from both the Koolau and Waianae Mountains, 83 of the 122 plant species for which we are designating 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 designating critical habitat only in 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 not included in the critical habitat units, and natural or manmade features (e.g., ridge lines, valleys, streams, coastlines, roads, obvious land features, etc.) were used to delineate critical habitat boundaries. Two species, *Chamaesyce skottsbergii* var. *skottsbergii* and *Doryopteris takeuchii* are not reported from either mountain range, and we are designating critical habitat only in their known geographic areas, the Ewa plain (Kalaeloa; represented by ''W'' for Waianae in Table 7A) and Diamond Head (represented by ''K'' for Koolau in Table 7A), respectively.

The critical habitat areas described below constitute our best assessment of the areas occupied at the time of listing containing the physical or biological features essential for the recovery and conservation of the 124 species, including unoccupied areas essential for the conservation of the species because they, for example, provide for the needed for expansion of reduced populations. The approximate size of each of the 62 plant critical habitat units and the 40 damselfly critical habitat units, and the status of their land ownership, are identified in Tables 6A and 6B, respectively. The species that currently occupy each of the 62 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 (Table 7B; see 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) and may be currently unoccupied by this species. All 40 damselfly critical habitat units overlap areas also designated as plant critical habitat.

When determining critical habitat boundaries within this rule, we made every effort to avoid including developed areas, such as buildings and paved areas, 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 rule have been excluded by text in the rule and are not designated 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.

The critical habitat designation is defined by the map or maps, as modified by any accompanying regulatory text, presented at the end of this document in the rule portion. We include more detailed information on the boundaries of the critical habitat designation in the preamble of this document. The coordinates or plot points, or both, on which each map is based, is available to the public at *http://www.fws.gov/pacificislands*, at *http://www.regulations.gov* at Docket No. FWS–R1–ES–2010–0043, and at the Pacific Islands Fish and Wildlife Office (see **ADDRESSES**, above).

TABLE 6A—CRITICAL HABITAT DESIGNATED FOR 121 OAHU PLANT SPECIES

[Totals may not sum due to rounding]

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	946	11	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	80	33	80	0	0	0
—Unit 10	74	30	0	0	74	0
—Unit 11	20	8	0	0	0	20
—Unit 12	11	5	0	0	0	11
—Unit 13	23	9	1	0	19	3
—Unit 14	4	2	0	2	2	0
—Unit 15	33	13	9	21	0	2

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

[Totals may not sum due to rounding]

Critical habitat area	Size of unit in acres	Size of unit in hectares	Land ownership (acres)			
			State	Federal	City and county	Private
TOTAL Coastal	1,332	539	1,164	34	95	38
Oahu—Lowland Dry						
—Unit 1	102	41	49	0	0	53
—Unit 2	29	12	0	29	0	0
—Unit 6	287	116	287	0	0	0
—Unit 7	15	6	15	0	0	0
—Unit 8	99	40	3	0	0	96
—Unit 9	37	15	1	16	17	3
—Unit 10	43	17	43	0	0	0
—Unit 11	166	67	0	166	0	0
TOTAL Lowland Dry	778	314	398	211	17	152
Oahu—Lowland Mesic						
—Unit 1	4,448	1,800	3,565	22	583	277
—Unit 2	1,062	430	1,062	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	1,663	673	681	0	129	852
TOTAL Lowland Mesic	7,822	3,166	5,722	22	712	1,364
Oahu—Lowland Wet						
—Unit 1	541	219	428	0	112	0
—Unit 2	19	8	19	0	0	0
—Unit 3	29	12	29	0	0	0
—Unit 4	27	11	27	0	0	0
—Unit 5	74	30	74	0	0	0
—Unit 6	790	320	0	0	0	790
—Unit 7	1,786	723	1,499	0	0	288
—Unit 8	3,041	1,231	1,386	0	0	1,655
—Unit 9	15,728	6,365	3,827	4,509	147	7,245
—Unit 10	124	50	0	0	0	124
—Unit 11	123	50	0	0	123	0
—Unit 12	53	21	0	0	28	26
—Unit 13	75	30	1	0	74	0
—Unit 14	478	193	274	0	195	9
—Unit 15	407	165	407	0	0	0
—Unit 16	2,507	1,014	1,533	0	365	608
TOTAL Lowland Wet	25,802	10,442	9,504	4,509	1,044	10, 745
Oahu—Montane Wet						
—Unit 1	370	150	352	0	18	<1
TOTAL Montane Wet	370	150	352	0	18	<1
Oahu—Dry Cliff						
—Unit 1	49	20	49	0	0	0
—Unit 2	412	167	320	0	91	0
—Unit 3	450	182	101	0	349	0
—Unit 4	24	10	24	0	0	0
—Unit 6	149	60	149	0	0	0
—Unit 7a	68	27	68	0	0	0
—Unit 7b	38	16	38	0	0	0
—Unit 8	259	105	259	0	0	0
TOTAL Dry Cliff	1,449	587	1,008	0	440	0
Oahu—Wet Cliff						
—Unit 1	235	95	167	0	68	<1
—Unit 2	3	1	3	0	0	0
—Unit 3	16	6	16	0	0	0
—Unit 4	23	9	23	0	0	0
—Unit 5	31	13	31	0	0	0
—Unit 6	151	61	151	0	0	0

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

[Totals may not sum due to rounding]

Critical habitat area	Size of unit in acres	Size of unit in hectares	Land ownership (acres)			
			State	Federal	City and county	Private
—Unit 7	144	58	144	0	0	0
—Unit 8	4,649	1,881	1,479	5	1,281	1,884
TOTAL Wet Cliff	5,252	2,124	2,014	5	1,349	1,884
TOTAL ALL UNITS	42,804	17,322	20,162	4,871	3,675	14,183

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

[Totals may not sum due to rounding]

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	1,786	723	1,499	0	0	288
—Unit 3	3,041	1,231	1,386	0	0	1,655
—Unit 4	15,728	6,365	3,827	4,509	147	7,245
—Unit 5	124	50	0	0	0	124
—Unit 6	123	50	0	0	123	0
—Unit 7	53	21	0	0	28	26
—Unit 8	75	30	1	0	74	0
—Unit 9	478	193	274	0	195	9
—Unit 10	407	165	407	0	0	0
—Unit 11	2,507	1,014	1,533	0	365	608
TOTAL Crimson Hawaiian Damselfly—Lowland Wet	25,112	10,162	8,927	4,509	932	10,745
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	1,479	5	1,281	1,884
TOTAL Crimson Hawaiian Damselfly—Wet Cliff	4,944	2,000	1,774	5	1,281	1,884
Blackline Hawaiian Damselfly—Lowland Wet						
—Unit 1	790	320	0	0	0	790
—Unit 2	1,786	723	1,499	0	0	288
—Unit 3	3,041	1,231	1,386	0	0	1,655
—Unit 4	15,728	6,365	3,827	4,509	147	7,245
—Unit 5	124	50	0	0	0	124
—Unit 6	123	50	0	0	123	0
—Unit 7	53	21	0	0	28	26
—Unit 8	75	30	1	0	74	0
—Unit 9	478	193	274	0	195	9
—Unit 10	407	165	407	0	0	0
—Unit 11	2,507	1,014	1,533	0	365	608
TOTAL Blackline Hawaiian Damselfly—Lowland Wet	25,112	10,162	8,927	4,509	932	10,745
Oceanic Hawaiian Damselfly—Lowland Mesic						
—Unit 1	247	100	12	0	0	235
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	1,786	723	1,499	0	0	288
—Unit 4	3,041	1,231	1,386	0	0	1,655
—Unit 5	15,728	6,365	3,827	4,509	147	7,245
—Unit 6	123	50	0	0	0	124

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

[Totals may not sum due to rounding]

Critical habitat unit	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	City and county	Private
—Unit 7	124	50	0	0	123	0
—Unit 8	53	21	0	0	28	26
—Unit 9	75	30	0	1	74	0
—Unit 10	478	193	274	0	195	9
—Unit 11	407	165	407	0	0	0
—Unit 12	2,507	1,014	1,533	0	365	608
TOTAL Oceanic Hawaiian Damselfly—Lowland Wet	25,112	10,162	8,927	4,509	932	10,745
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	1,479	5	1,281	1,884
TOTAL Oceanic Hawaiian Damselfly—Wet Cliff	4,944	2,000	1,774	5	1,281	1,884

TABLE 7A—SPECIES FOR WHICH CRITICAL HABITAT IS DESIGNATED 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)
PLANTS									
Abutilon sandwicense			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Achyranthes splendens var. *rotundata.*	X[W]	X[W]				X[W]		2,941 (1,190)	932 (377)
Adenophorus periens				X[K–H]			X[K–H]	30,056 (12,163)	5,901 (2,388)
Alectryon macrococcus			X[W, K–H]		X[W]	X[W]		9,641 (3,902)	2,250 (911)
Bidens amplectens	X[W]	X[W]						1,493 (604)	67 (27)
Bonamia menziesii		X[W]	X[W, K]			X[W]		9,747 (3,944)	1,919 (777)
Cenchrus agrimonioides			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Centaurium sebaeoides	X[W, K]							1,332 (539)	0 (0)
Chamaesyce celastroides var. *kaenana.*	X[W]	X[W]	X[W, K–H]					9,315 (3,770)	1,504 (427)
Chamaesyce deppeana							X[K]	4,944 (2,001)	60 (24)
Chamaesyce herbstii			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Chamaesyce kuwaleana	X[K–H]					X[W]		1,764 (714)	865 (350)
Chamaesyce rockii				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)
Chamaesyce skottsbergii var. *skottsbergii.*		X[W]						345 (139)	0 (0)
Colubrina oppositifolia			X[W]					5,884 (2,381)	861 (349)
Ctenitis squamigera			X[W, K–H]					7,823 (3,166)	987 (349)
Cyanea acuminata			X[W, K]	X[W, K]	X[W]		X[W, K]	39,247 (15,883)	7,548 (3,055)
Cyanea calycina			X[W, K]	X[W, K]	X[W]		X[W, K]	39,247 (15,883)	7,548 (3,055)
Cyanea crispa			X[K]	X[K]			X[K]	31,995 (12,948)	6,027 (2,439)
Cyanea grimesiana ssp. *Grimesiana*			X[W, K]	X[W, K]				33,624 (13,607)	6,989 (2,828)
Cyanea grimesiana ssp. *obatae*			X[W]	X[W]		X[W]		8,022 (3,246)	1,887 (764)
Cyanea humboldtiana				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)
Cyanea koolauensis				X[K]				25,112 (10,163)	5,841 (2,364)
Cyanea lanceolata			X[K]	X[K]				27,051 (10,947)	5,966 (2,415)
Cyanea longiflora			X[W, K–H]					7,823 (3,166)	987 (399)
Cyanea pinnatifida			X[W–H]					5,884 (2,381)	861 (349)
Cyanea purpurellifolia				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)
Cyanea st.-johnii				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)
Cyanea superba			X[W]					5,884 (2,381)	861 (349)
Cyanea truncata			X[K]	X[K–H]			X[K–H]	31,995 (12,948)	6,027 (2,439)
Cyperus pennatiformis			X[W–H]					5,884 (2,381)	861 (349)
Cyperus trachysanthos	X[W, K]	X[W, K]						112 (45)	50 (20)
Cyrtandra dentata			X[W, K]	X[W, K]		X[W]		35,073 (14,194)	7,854 (3,178)
Cyrtandra gracilis				X[K]				25,112 (10,163)	5,841 (2,634)
Cyrtandra kaulantha				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)
Cyrtandra polyantha			X[K]	X[K]				27,051 (10,947)	65,966 (2,415)
Cyrtandra sessilis				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)
Cyrtandra subumbellata				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)
Cyrtandra viridiflora				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)
*Cyrtandra waiolani**				X[K–H]				25,112 (10,163)	5,841 (2,364)
Delissea subcordata			X[W, K–H]					7,823 (3,166)	987 (399)
Diellia erecta			X[K]					1,939 (785)	126 (51)
Diellia falcata			X[W, K–H]			X[W]		9,271 (3,752)	1,534 (621)
Diellia unisora			X[W]			X[W]		7,332 (2,967)	1,726 (699)

TABLE 7A—SPECIES FOR WHICH CRITICAL HABITAT IS DESIGNATED 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)
Diplazium molokaiense			X[W–H]	X[W–H]				6,573 (2,660)	1,023 (414)
Doryopteris takeuchii		X[K]						301 (122)	0 (0)
Dubautia herbstobatae			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Eragrostis fosbergii			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Eugenia koolauensis			X[W, K]					7,823 (3,166)	987 (399)
Euphorbia haeleeleana		X[W]	X[W]					6,359 (2,573)	929 (376)
Flueggea neowawraea			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Gardenia mannii			X[W, K]	X[W, K]				33,624 (13,607)	6,989 (2,828)
Gouania meyenii		X[W, K–H]	X[W]			X[W]		8,109 (3,281)	1,793 (726)
Gouania vitifolia		X[W]	X[W–H]	X[W]		X[W]		8,497 (3,439)	1,955 (791)
Hesperomannia arborescens			X[W, K]	X[K]				32,935 (13,328)	6,827 (2,763)
Hesperomannia arbuscula			X[W]	X[W]				6,573 (2,660)	1,023 (414)
Hibiscus brackenridgei		X[W]	X[W]					6,359 (2,573)	929 (376)
Huperzia nutans				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)
Isodendrion laurifolium			X[W, K–H]			X[W]		9,271 (3,752)	1,852 (749)
Isodendrion longifolium			X[W, K]	X[W, K]				33,624 (13,607)	6,989 (2,828)
Isodendrion pyrifolium		X[W–H]				X[W–H]		1,924 (779)	932 (377)
Kadua coriacea			X[W–H, K–H]					7,823 (3,166)	987 (399)
Kadua degeneri			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Kadua parvula			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Korthalsella degeneri						X[W]		1,449 (586)	865 (350)
Labordia cyrtandrae			X[W, K]	X[W, K]	X[W]		X[W, K]	39,247 (15,883)	7,548 (3,055)
Lepidium arbuscula						X[W]		1,449 (586)	865 (350)
Lipochaeta lobata var. *leptophylla*						X[W]		1,449 (586)	865 (350)
Lobelia gaudichaudii ssp. *koolauensis.*				X[K]				25,112 (10,163)	5,841 (2,364)
Lobelia monostachya			X[K]					1,939 (785)	126 (51)
Lobelia niihauensis			X[W]			X[W]		7,372 (2,967)	1,726 (699)
Lobelia oahuensis				X[W, K]	X[W]		X[W, K]	31,425 (12,717)	6,562 (2,655)
Lysimachia filifolia							X[K]	4,944 (2,001)	60 (24)
Marsilea villosa	X[W, K]	X[W, K]						127 (51)	50 (20)
Melanthera tenuifolia		X[W]	X[W]			X[W]		7,808 (3,160)	1,793 (726)
Melicope christophersenii					X[W]		X[W]	679 (275)	499 (202)
Melicope hiiakae				X[K]				25,112 (10,163)	5,841 (2,364)
Melicope lydgatei			X[K]	X[K]				27,051 (10,947)	5,966 (2,415)
Melicope makahae			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Melicope pallida			X[W]					5,884 (2,381)	861 (349)
Melicope saint-johnii			X[W, K–H]			X[W]		9,271 (3,752)	1,852 (749)
Myrsine juddii				X[K]				25,112 (10,163)	5,841 (2,364)
Neraudia angulata		X[W]	X[W]			X[W]		7,808 (3,160)	1,793 (726)
Nototrichium humile		X[W]	X[W]			X[W]		7,808 (3,160)	1,793 (726)
Peucedanum sandwicense						X[W]		1,449 (586)	865 (350)
Phyllostegia hirsuta			X[W, K]	X[W, K]	X[W]		X[W, K]	39,247 (15,883)	7,548 (3,055)
Phyllostegia kaalaensis			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Phyllostegia mollis			X[W, K–H]	X[W]				8,512 (3,445)	1,148 (465)
Phyllostegia parviflora var. *lydgatei*			X[W–H]					5,884 (2,381)	861 (349)
Phyllostegia parviflora var. *parviflora*			X[K–H]	X[K]			X[K]	31,995 (12,948)	6,027 (2,439)
Plantago princeps var. *longibracteata*				X[K–H]				25,112 (10,163)	5,841 (2,364)
Plantago princeps var. *princeps*			X[W, K–H]	X[W, K]		X[W]	X[K]	35,382 (14,319)	7,954 (3,219)
Platanthera holochila				X[K]				25,112 (10,163)	5,841 (2,364)
Platydesma cornuta var. *cornuta*				X[K]				25,112 (10,163)	5,841 (2,364)
Platydesma cornuta var. *decurrens*			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Pleomele forbesii		X[W]	X[W, K]			X[W]		9,747 (3,944)	1,919 (777)
Psychotria hexandra ssp. *oahuensis*				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)
Pteralyxia macrocarpa			X[W, K]	X[W, K]		X[W]	X[W, K]	40,326 (16,320)	8,014 (3,243)
Pteris lidgatei				X[K]				25,112 (10,163)	5,841 (2,364)
Sanicula mariversa			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Sanicula purpurea				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)
Schiedea hookeri		X[W]	X[W]	X[W]		X[W]	X[W]	8,806 (3,564)	2,055 (832)
Schiedea kaalae			X[W, K]	X[W]			X[W, K]	13,765 (5,571)	1,309 (529)
Schiedea kealiae	X[W]	X[W]						1,493 (604)	67 (27)
Schiedea nuttallii			X[W, K–H]					7,823 (3,166)	987 (399)
Schiedea obovata			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Schiedea trinervis					X[W]	X[W]	X[W]	2,127 (861)	1,364 (552)
Sesbania tomentosa	X[W, K]							1,332 (539)	0 (0)
Silene lanceolata						X[W]		1,449 (586)	865 (350)
Silene perlmanii			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Solanum sandwicense			X[W–H, K–H]					7,823 (3,166)	987 (399)
Spermolepis hawaiiensis		X[W, K]				X[W]		2,225 (900)	932 (377)
Stenogyne kanehoana			X[W]					5,884 (2,381)	861 (349)
Tetramolopium filiforme						X[W]		1,449 (586)	865 (350)
Tetramolopium lepidotum ssp. *lepidotum.*			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Tetraplasandra gymnocarpa			X[K]	X[K]			X[K]	31,995 (12,948)	6,027 (2,439)
Tetraplasandra lydgatei			X[K]					1,939 (785)	126 (51)
Trematolobelia singularis				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)

TABLE 7A—SPECIES FOR WHICH CRITICAL HABITAT IS DESIGNATED 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)
Urera kaalae			X[W]	X[W]				6,573 (2,660)	1,023 (414)
Vigna o-wahuensis	X[W–H, K–H]							1,332 (539)	0 (0)
Viola chamissoniana ssp. *chamissoniana.*			X[W]			X[W]		7,332 (2,967)	1,726 (699)
Viola oahuensis				X[K]			X[K]	30,056 (12,163)	5,901 (2,388)
Zanthoxylum oahuense				X[K]				25,112 (10,163)	5,841 (2,364)
ANIMALS									
blackline Hawaiian damselfly				X[W–H, K]				25,112 (10,163)	5,841 (2,364)
crimson Hawaiian damselfly				X[W–H, K]			X[K]	30,056 (12,163)	5,901 (2,388)
oceanic Hawaiian damselfly			X[K]	X[W–H, K]			X[K]	30,303 (12,263)	6,027 (2,439)
Designated CH ac (ha)	1,332 (539)	776 (314)	7,823 (3,166)	25,802 (10,442)	370 (150)	1,449 (586)	5,253 (2,126)		
Exempt Area ac (ha)	0 (0)	335 (136)	987 (399)	6,002 (2,429)	399 (161)	865 (350)	161 (65)		
Total Area Designated as Critical Habitat (including Exempt Area) ac (ha).	1,332 (539)	1,111 (450)	8,810 (3,565)	31,804 (12,871)	769 (311)	2,314 (936)	5,414 (2,191)		

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	Designated critical habitat		Acres (hectares) exempt from critical habitat		Total area considered	
	Ac	Ha	Ac	Ha	Ac	Ha
Coastal	1,332	539	0	0	1,332	539
Lowland Dry	776	314	335	136	1,111	450
Lowland Mesic	7,823	3,166	987	399	8,810	3,565
Lowland Wet	25,802	10,442	6,002	2,429	31,804	12,871
Montane Wet	370	150	399	161	769	311
Dry Cliff	1,449	586	865	350	2,314	936
Wet Cliff	4,649	1,881	161	65	5,414	2,191

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 critical habitat units. The following discussion of special management needs is therefore applicable to each of the 124 Oahu species for which we are designating critical habitat.

The 124 Oahu species for which we are designating 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 that the features essential to their conservation are primarily dependent on 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 designated to avoid further degradation or destruction of the habitat that provides those features essential to their conservation. The primary threats to the physical or biological features essential to the conservation of all of these species include habitat destruction and modification by 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 rule.

All critical habitat, except 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 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 25 of the designated 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 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 6, Oahu—Dry Cliff—Unit 7 (Oahu—Dry Cliff—Unit 7a and Oahu—Dry Cliff—Unit 7b), 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 *Melinis minutiflora* that increase the fuel load and quickly regenerate after a fire. These nonnative grass species can outcompete native plants that are not adapted to fire, creating a grass-fire cycle that alters ecosystem functions (D'Antonio and Vitousek 1992, pp. 64–66; Brooks *et al.* 2004, p. 680).

Thirty-four of the 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 6, Oahu—Dry Cliff—Unit 7 (Oahu—Dry Cliff—Unit 7a and Oahu—Dry Cliff—Unit 7b), 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 23 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, Plantago princeps, 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 the 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 Lowland Mesic unit 1, 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 designating 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 designated as critical habitat that are outside the geographical areas occupied by these species have been determined to be essential for their conservation.

Critical Habitat Designation

We are designating 42,804 ac (17,322 ha) as critical habitat in 7 ecosystem types for 124 species. The critical habitat is comprised of 62 critical habitat units for the plants and 40 critical habitat units for the damselflies (see Tables 6A and 6B, above, for details). The critical habitat includes land under State, City and County of Honolulu, Federal (Department of Defense–Navy; Department of Homeland Security–Coast Guard; Department of the 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 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 at 50 CFR 17.99(i) for Oahu plants and at 50 CFR 17.95(i) for the 3 damselfly species. However, the same geographic area represents designated critical habitat for both plants and damselflies in some portions of Oahu. For example, Oahu—Lowland Mesic—Unit 6 and oceanic Hawaiian damselfly—Unit 1—Lowland Mesic correspond to the same geographic area. Therefore, because the unit boundaries are the same, we are describing them only once to avoid redundancy, as indicated in the unit descriptions by the

inclusion of ''(and)'' following the unit name.

As provided under section 4(b)(2) of the Act, some or portions of each of these areas were considered for exclusion from critical habitat in this final rule. Exclusions are considered based weighing the benefits of inclusion against the benefits of excluding such area in critical habitat after considering all relevant impacts, including information provided during the public comment period on potential economic impacts of this critical habitat designation. 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 946 ac (383 ha) of State land, 11 ac (4 ha) of Federal land, and 2 ac (1 ha) of privately owned land in the coastal ecosystem along the northwestern coast of Oahu from Kaena Point east to Kauhao Pali and southeast to Keawaula. This unit is 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 Oahu—Coastal—Unit 2 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 Oahu—Coastal—Unit 3 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 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 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 Oahu—Coastal—Unit 5 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 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,* 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 9 consists of 80 ac (33 ha) of State 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 PCEs unique for the plants *C. trachysanthos* and *M. villosa* (see Tables 4 and 5). 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,* 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 11 consists of 20 ac (8 ha) of privately owned 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 PCEs unique for this species (see Tables 4 and 5). 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 PCEs unique for this species (see Tables 4 and 5). 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 19 ac (8 ha) of City and County land, 1 ac (0.5 ha) of State land, and 3 ac (1 ha) of privately owned land in the coastal ecosystem 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,* 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 14 consists of 2 ac (1 ha) of City and County of Honolulu land, and 2 ac (1 ha) of Federal land (U.S. Coast Guard) in the coastal ecosystem 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,* 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 15 consists of 9 ac (4 ha) of State land, 2 ac (1 ha) of privately owned land, and 21 ac (9 ha) of 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 49 ac (20 ha) of State land and 53 ac (22 ha) of 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 Federal 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 angulata, 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 range 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 Tables 4 and 5). 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* (see Table 5). 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 96 ac (40 ha) of privately owned land and 3 ac (1 ha) of State land as part of the old railroad right-of-way in the lowland dry ecosystem, at the Kalaeloa Barber's Point Harbor area. The area was occupied by *Chamaesyce skottsbergii* var. *skottsbergii* at the time the species was listed (see 47 FR 36846, August 24, 1982), although it is not currently known to be occupied by *C. skottsbergii* var. *skottsbergii.* The species was last observed on this site in 1989. However, even though the site is degraded, during two recent field surveys (November 2011 and June 2012), we verified that the area being designated contains the physical and biological features of the lowland dry ecosystem and the coral outcrop substrate that is essential for the conservation of *C. skottsbergii* var. *skottsbergii* (see Tables 4 and 5). Based on the field visits, the boundaries of the unit were revised to remove areas that were modified by construction and excavation activities, and do not contain essential features. This resulted in the reduction of the unit from the 292 ac (118 ha) that were originally proposed to the 99 ac (40 ha) that are included in this final rule.

These physical and biological features are essential to the conservation of the species in this location because the conservation of the species requires re-establishment of populations of this species in areas where it once occurred. Based on our evaluation of the conservation needs for *Chamaesyce skottsbergii* var. *skottsbergii*, a plant requiring another individual for pollination (obligate-outcrosser) and living 10 years or less (short-lived perennial), we will need 7 to 8 populations containing a total of 10,000 mature individuals with at least 1,000 mature individuals per population in order to recover the species. The numbers of individuals and numbers of populations calculated for the 4 Lowland Dry units for akoko was based on our analysis (white paper) ''Recovery Needs and Strategy for Akoko'', June 20, 2012. This analysis incorporated data from the Recovery Plan for *C. skottsbergii* var. *skottsbergii* and *Achyranthes splendens* var. *rotundata* (1993), surveys/species reports from 1979, 1981, 1984, and 2012, the Revised Recovery Objective Guidelines as determined by the Hawaii and Pacific Plants Recovery Coordinating Committee (HPPRCC) 2011, and plant genetics information from Guerrant *et al.* (2004, pp. 419–441) and Neel and Cummings (2003).

Currently, *Chamaesyce skottsbergii* var. *skottsbergii* is found in 2 occurrences in the lowland dry ecosystem on the Ewa Plain in southwestern Oahu, totaling approximately 200 wild individuals and 600 outplanted individuals (Guinther and Withrow 2008, pp. 6, 9–10; Whistler 2008, pp. 7–9; U.S. Navy *et al.* 2012, pp. 19–20). In our review of areas on the Ewa Plain where the features essential to the conservation of this species are still present, we were only able to find four sites that still had the essential features; were not already modified by construction, development, or excavation activities; were large enough to provide habitat for at least one self-sustaining population; and provided adequate distribution across the historical range of the species. To the extent that portions of this unit may not have been occupied at the time of listing, they are essential to the conservation of the species because, as discussed above, conservation of this species will require establishment of additional populations and this is one of the few suitable locations. Oahu—Lowland Dry—Unit 8 is one of four locations included in this final critical habitat designation that is essential to the conservation of *Chamaesyce skottsbergii* var. *skottsbergii*. It was previously occupied by the species and still contains the features essential to its conservation, such as the unique coral outcrop substrate. Oahu—Lowland Dry—Unit 8 may be able to provide for two separate populations of *C. skottsbergii* var. *skottsbergii*. A designation limited to areas presently occupied by the species would be inadequate to ensure the conservation of the species because the one occupied unit (only Oahu—Lowland Dry—Unit 11, see below, is occupied by wild individuals; Oahu—Lowland Dry—Unit 9 contains outplanted, propagated individuals) would not provide enough area to support 7 to 8 populations needed for recovery, as determined in the ''Recovery Needs and Strategy for *Chamaesyce skottsbergii* var. *skottsbergii* (Ewa Plains akoko)'' (Service 2012, entire).There are no other geographic areas that are both undeveloped and contain the species-specific PCE of coral outcrop substrate.

Oahu—Lowland Dry—Unit 8 is not known to be occupied by *Bidens amplectens*, one of the plants being listed in this rule as endangered. However, we have determined the lands within this unit are essential for the conservation of this lowland dry species, because they provide the habitat necessary for the reestablishment of wild populations within the historical ranges of the species (see Table 4). Due to their 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. Additionally, Oahu—Lowland Dry—Unit 8 was not occupied by the endangered plants *Achyranthes splendens* var. *rotundata, Bonamia menziesii*, *Chamaesyce celastroides* var. *kaenana, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Schiedea hookeri, S. kealiae*, or *Spermolepis hawaiiensis* (see 51 FR 10518, March 26, 1986, and 68 FR 35950, June 17, 2003, for previous Federal actions), at the time they were listed, and is not currently known to be occupied by these 14 species. However, we have determined the lands within this unit are essential for the conservation of these lowland dry species, because they provide the habitat necessary for the reestablishment of wild populations within the historical ranges of the species (see Table 4). 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 17 ac (7 ha) of City and County land,

3 ac (1 ha) of privately owned land, 1 ac (0.5 ha) of State land, and 16 ac (6 ha) of Federal (Pearl Harbor NWR) land in the lowland dry ecosystem at Kalaeloa. This unit was not occupied by *Chamaesyce skottsbergii* var. *skottsbergii* at the time the species was listed (see 47 FR 36846, August 24, 1982). As noted in the description of Oahu—Lowland Dry—Unit 8 above, we have determined that for *C. skottsbergii* var. *skottsbergii*, a plant requiring another individual for pollination (obligate-outcrosser) and living 10 years or less (short-lived perennial), we will need 7 to 8 populations containing at least a total of 10,000 mature individuals with at least 1,000 mature individuals per population in order to recover the species HPPRCC 2011; Guerrant *et al.* 2004, pp. 419–441; Neel and Cummings 2003). Oahu—Lowland Dry—Unit 9 is one of the four locations included in this final critical habitat designation that is essential to the conservation of *C. skottsbergii* var. *skottsbergii*; please see discussion of the importance of these areas on the Ewa Plain, above, in the description of Oahu—Lowland Dry—Unit 8. This unit is currently occupied by recently outplanted individuals of *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, and the unique PCEs for the species *C. skottsbergii* var. *skottsbergii* (see Tables 4 and 5). 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 populations. Oahu—Lowland Dry—Unit 9 may be able to provide for one separate population of *C. skottsbergii* var. *skottsbergii*. Oahu—Lowland Dry—Unit 9 is not known to be occupied by another plant being listed as endangered in this rule, *Bidens amplectens*. We have determined this area to be essential for the conservation and recovery of both of these lowland dry species because it provides the habitat necessary for the reestablishment of wild populations within the historical ranges of the species (see Table 4). 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. A designation limited to areas presently occupied by the species would be inadequate because the one occupied unit (only Oahu—Lowland Dry—Unit 11, see below, is occupied by wild individuals; Oahu—Lowland Dry—Unit 9 contains outplanted, propagated individuals) would not provide enough area to support 7 to 8 populations needed for recovery, as determined in the ''Recovery Needs and Strategy for *Chamaesyce skottsbergii* var. *skottsbergii* (Ewa Plains akoko)'' (Service 2012, entire). There are no other geographic areas that are both undeveloped and contain the species-specific PCE of coral outcrop substrate.

Additionally, Oahu—Lowland Dry—Unit 9 was not occupied by the endangered plants *Achyranthes splendens* var. *rotundata, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Schiedea hookeri, S. kealiae*, or *Spermolepis hawaiiensis* (see 51 FR 10518, March 26, 1986 and 68 FR 35950, June 17, 2003), at the time they were listed, and is not currently known to be occupied by these 14 species. 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 (see Table 4). 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 (DHHL) in the lowland dry ecosystem at Kalaeloa. This unit was not occupied by *Chamaesyce skottsbergii* var. *skottsbergii* at the time the species was listed (see 47 FR 36846, August 24, 1982); however, *C. skottsbergii* var. *skottsbergii* was observed in the area in 1998, but has not been re-observed since that time. As noted in the description of Oahu—Lowland Dry—Unit 8, above, we have determined that *C. skottsbergii* var. *skottsbergii*, a plant requiring another individual for pollination (obligate-outcrosser) and living 10 years or less (short-lived perennial), we will need 7 to 8 populations containing a total of 10,000 mature individuals with at least 1,000 mature individuals per population in order to recover the species (HPPRCC 2011; Guerrant *et al.* 2004, pp. 419–441; Neel and Cummings 2003). Oahu—Lowland Dry—Unit 10 is one of the four locations included in this final critical habitat designation that is essential to the conservation of *C. skottsbergii* var. *skottsbergii*; please see discussion of the importance of these areas on the Ewa Plain, above, in the description of Oahu—Lowland Dry—Unit 8. This unit was previously occupied by *Chamaesyce skottsbergii* var. *skottsbergii* and still contains the features essential to its conservation, such as the unique coral outcrop substrate (see Tables 4 and 5). In the future, Oahu—Lowland Dry—Unit 10 may be able to provide for one separate population of *C. skottsbergii* var. *skottsbergii*. A designation limited to areas presently occupied by the species would be inadequate to ensure the conservation of the species, because the one occupied unit (Oahu—Lowland Dry—Unit 11) would not provide enough area to support 7 to 8 populations needed for recovery, as determined in the ''Recovery Needs and Strategy for *Chamaesyce skottsbergii* var. *skottsbergii* (Ewa Plains akoko)'' (Service 2012, entire). There are no other geographic areas that are both undeveloped and contain the species-specific PCE of coral outcrop substrate.

Oahu—Lowland Dry—Unit 10 is not known to be occupied by another plant being listed as endangered in this rule, *Bidens amplectens*. However, 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 (see Table 4). Due to its small numbers of individuals or low population sizes, this species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery. Additionally, Oahu—Lowland Dry—Unit 10 was not occupied by the endangered plants *Achyranthes splendens* var. *rotundata, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Schiedea hookeri, S. kealiae*, or *Spermolepis hawaiiensis* (see 51 FR 10518, March 26, 1986, and 68 FR 35950, June 17, 2003), at the time they were listed, and is not currently known to be occupied by these 14 species. 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 (see Table 4). 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.

We are aware of the planned development of the Kalaeloa Solar One and Two alternative energy facilities (DHHL 2011, in litt.) on lands within, and adjacent to, this unit. The facilities, which are independently owned and operated, are being developed for the purpose of reducing Oahu's dependence on fossil-fuel for power generation. The January 2011 Draft Environmental Assessment prepared for this project states that no Federal funding or Federal authorizations will be required to develop this facility. We are also unaware of any Federal nexus for this project. Accordingly, since a critical habitat designation only triggers a consultation under section 7(a)(2) of the Act for activities that have a Federal nexus, the designation of this unit as critical habitat is not anticipated to have an impact on this project as proposed.

Oahu—Lowland Dry—Unit 11 consists of 166 ac (67 ha) of federal land (U.S. Navy) in the lowland dry ecosystem at Kalaeloa. The area was occupied by *Chamaesyce skottsbergii* var. *skottsbergii* at the time the species was listed (47 FR 36846, August 24, 1982), and is currently occupied by *C. skottsbergii* var. *skottsbergii*. As noted in the description of Oahu—Lowland Dry—Unit 8, above, we have determined that for *C. skottsbergii* var. *skottsbergii*, a plant requiring another individual for pollination (obligate-outcrosser) and living 10 years or less (short-lived perennial), we will need 7 to 8 populations containing a total of 10,000 mature individuals with at least 1,000 mature individuals per population in order to recover the species (HPPRCC 2011; Guerrant *et al.* 2004, pp. 419- 441; Neel and Cummings 2003). Oahu—Lowland Dry—Unit 11 is one of the four locations included in this final critical habitat designation that is essential to the conservation of *C. skottsbergii* var. *skottsbergii*; please see discussion of the importance of these areas on the Ewa Plain, above, in the description of Oahu—Lowland Dry—Unit 8.

Oahu—Lowland Dry—Unit 11 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 *Chamaesyce skottsbergii* var. *skottsbergii* (see Tables 4 and 5). This unit also contains unoccupied habitat that is essential to the conservation of this species by providing the habitat necessary for the expansion of the existing wild populations. A designation limited to areas presently occupied by the species would be inadequate to ensure the conservation of the species because this occupied unit (only Oahu—Lowland Dry—Unit 11 is occupied by wild individuals; Oahu—Lowland Dry—Unit 9 (see above) contains outplanted, propagated individuals, not wild plants) would not provide enough area to support 7 to 8 populations needed for recovery, as determined in the ''Recovery Needs and Strategy for *Chamaesyce skottsbergii* var. *skottsbergii* (Ewa Plains akoko)'' (Service 2012, entire). There are no other geographic areas that are both undeveloped and contain the species-specific PCE of coral outcrop substrate. In the future, Lowland Dry—Unit 11 may be able to provide for three or four separate populations of *C. skottsbergii* var. *skottsbergii*.

Oahu—Lowland Dry—Unit 11 is not known to be occupied by another plant being listed as endangered in this rule, *Bidens amplectens*. However, 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 (see Table 4). Due to its small numbers of individuals or low population sizes, this species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery. Additionally, Lowland Dry—Unit 11 was not occupied by the endangered plants *Achyranthes splendens* var. *rotundata, Bonamia menziesii, Chamaesyce celastroides* var. *kaenana, Euphorbia haeleeleana, Gouania meyenii, G. vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium, Melanthera tenuifolia, Neraudia angulata, Nototrichium humile, Schiedea hookeri, S. kealiae*, or *Spermolepis hawaiiensis* (see 51 FR 10518, March 26, 1986, and 68 FR 35950, June 17, 2003) at the time they were listed, and is not currently known to be occupied by these 14 species. 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 (see Table 4). 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.

We are aware and supportive of the efforts underway by State and the Navy, in coordination with the Service, to develop a long-term preservation or conservation plan for *Chamaesyce skottsbergii* var. *skottsbergii* within this unit. These include the development of a State of Hawaii Habitat Conservation Plan and the conditional transfer of some of the Navy lands within this unit to the Hawaii Community Development Authority (HCDA). The State of Hawaii Endangered Species Act already prohibits the take of individual listed plants by the State or any other non-Federal entity, without State review and authorization. If the lands are transferred by the Navy, the deed will require Grantees and successors to enter into a legally binding conservation and management plan approved by the Hawaii Department of Land and Natural Resources, to ensure protection of *C. skottsbergii* var. *skottsbergii* before conveying the property (U.S. Navy 2011, in litt.), based on the species being State and federally listed. The purpose of this agreement is to ensure the use or development of the transferred property does not adversely affect *C. skottsbergii* var. *skottsbergii*, as long as the species remains listed under the Act. If the Navy lands are transferred to HCDA, a portion of the lands may be used to develop a photovoltaic alternative energy project (HCDA 2012, in litt.; HDOFAW 2012, in litt.). The HCDA plans to use a portion of the revenue generated by commercial use of HCDA property to fund the conservation actions required under a conservation management plan (U.S. Navy 2011, in litt.). The Service is committed to working with the Navy and HCDA in the development of this conservation plan, to ensure it will provide for the long-term conservation of the plant and its habitat. Because of this close coordination, and because the deed restriction stipulates that *C. skottsbergii* var. *skottsbergii* will not be adversely affected, we believe the development of the photovoltaic alternative energy project, as proposed, will not be impacted by the designation of critical habitat in this unit, and it is our intent to work with our partners to facilitate this project.

Oahu—Lowland Mesic—Unit 1 consists of 3,565 ac (1,443 ha) of State land, 583 ac (236 ha) of City and County of Honolulu land, 22 ac (9 ha) of Federal land, and 277 ac (112 ha) of privately owned land in the lowland mesic ecosystem in the Waianae Mountains, encompassing a large area including the north slopes of Mt. Kaala, from the Pahole NAR to the Kaala NAR, and south to the Waianae Kai Forest Reserve (FR). This unit is occupied by the plants *Abutilon sandwicense*, *Alectryon*

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, Plantago 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 niihauensis, Melanthera tenuifolia, Melicope makahae, M. pallida, M. saint-johnii, Neraudia angulata, Nototrichium humile, Phyllostegia parviflora, Plantago 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, Cenchrus agrimonioides, Delissea subcordata, Diellia falcata, D. unisora, Hesperomannia arbuscula, Melicope saint-johnii, Phyllostegia mollis, P. parviflora, Plantago 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 5). 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 niihauensis, 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, 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, Plantago 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 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, 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, 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, Plantago 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 12 ac (5 ha) State land and 235 ac (95 ha) of privately owned land in the lowland mesic ecosystem on the windward side of the Koolau Mountains, inland of Kaaawa Point, 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 Tables 4 and 5). 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's 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, 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, Plantago 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 681 ac (276 ha) of State land, 129 ac (52 ha) of City and County of Honolulu land, and 852 ac (345 ha) of privately-owned land in the lowland mesic ecosystem on the leeward side of the Koolau Mountains, 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, 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, Plantago 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 428 ac (173 ha) of State land and 112 ac (46 ha) of City and County of Honolulu land 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, 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, 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 19 ac (8 ha) of State land 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, Plantago princeps, 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, Plantago princeps, 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, Phyllostegia hirsuta, Plantago princeps, 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 (30 ha) of State land 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, Phyllostegia hirsuta, P. mollis, Plantago princeps, 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) of privately owned land in the lowland wet ecosystem, in 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 canopy, 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 Tables 4 and 5). 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 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. kaulantha, C. polyantha, C. sessilis, C. subumbellata, C. viridiflora, C. waiolani, Gardenia mannii, Huperzia nutans, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope hiiakae, M. lydgatei, Myrsine juddii, Phyllostegia hirsuta, P. parviflora, Plantago princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* or *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 1,499 ac (606 ha) of State land and 288 ac (117 ha) of privately-owned land in the lowland wet ecosystem on the windward side of the Koolau Mountains, 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 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 Tables 4 and 5). 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's 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 the plants *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, Plantago princeps, Platanthera holochila, Psychotria hexandra* ssp. *oahuensis, Sanicula purpurea,* or *Trematolobelia singularis,* or by 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 1,386 ac (561 ha) of State land and 1,655 ac (670 ha) of privately-owned land in the lowland wet ecosystem on the windward side of the Koolau Mountains, 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 canopy, 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 Tables 4 and 5). 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's 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, Plantago princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* or *Zanthoxylum oahuense,* or by 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 3,827 ac (1,545 ha) of State land, 147 ac (60 ha) of City and County of Honolulu land, 4,509 ac (1,825 ha) of Federal land (U.S. Fish and Wildlife Service), and 7,245 ac (2,932 ha) of privately owned land in the lowland wet ecosystem on the leeward side of the Koolau Mountains, 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, Plantago 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 canopy, 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 Tables 4 and 5). 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's 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, 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, Platanthera holochila, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Sanicula purpurea,* or *Trematolobelia singularis,* or by 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) of privately-owned land in the lowland wet ecosystem in 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 canopy, 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 Tables 4 and 5). 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's 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 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. 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, Plantago princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra ssp. oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula*

purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis, or *Zanthoxylum oahuense,* or by the 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—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 canopy, 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 Tables 4 and 5). 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's 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 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. 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, Plantago princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* or *Zanthoxylum oahuense,* or by 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 28 ac (11 ha) of City and County of Honolulu land and 26 ac (10 ha) of privately-owned land in the lowland wet ecosystem 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 canopy, 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 Tables 4 and 5). 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's 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 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. 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, Plantago princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra ssp. oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* or *Zanthoxylum oahuense,* or by the 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—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 74 ac (30 ha) of City and County of Honolulu land and 1 ac (0.5 ha) of State land in the lowland wet ecosystem 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 canopy, 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 Tables 4 and 5). 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's 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 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. 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, Plantago princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* or *Zanthoxylum oahuense,* or by the 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—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 274 ac (111 ha) of State land, 195 ac (79 ha) of City and County of Honolulu land, and 9 ac (4 ha) of privately owned land in the lowland wet ecosystem 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 canopy, 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 Tables 4 and 5). 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's 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. 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, Plantago princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* or *Zanthoxylum oahuense,* or by the 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—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 in 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 by the blackline Hawaiian damselfly, 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, as well as unique PCEs for the Hawaiian damselfly (see Tables 4 and 5). 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's 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 the plants *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, Plantago princeps, Platanthera holochila, Platydesma cornuta* var. *cornuta, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis, Viola oahuensis,* or *Zanthoxylum oahuense,* or by the 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—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 1,533 ac (621 ha) of State land, 365 ac (148 ha) of City and County of Honolulu land, and 608 (246 ha) of privately owned land in the lowland wet ecosystem in 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. 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 canopy, 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 Tables 4 and 5). 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 grimesiana* ssp. *grimesiana, C. 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, Plantago princeps, Platanthera holochila, Psychotria hexandra* ssp. *oahuensis, Pteralyxia macrocarpa, Pteris lidgatei, Trematolobelia singularis, Viola oahuensis,* or *Zanthoxylum oahuense,* or by 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 18 ac (7 ha) of City and County of Honolulu land, 352 ac (142 ha) of State land, and less than 1 ac (less than one ha) of privately-owned land in the montane wet ecosystem at the summit of the Waianae Mountains at Kaala, 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, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of 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, 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 320 ac (130 ha) of State land and 91 ac (37 ha) of City and County of Honolulu land in the dry cliff ecosystem, on the leeward side of the Waianae Mountains, along the ridge from Keaau to Ohikilolo. This unit is 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, 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 349 ac (141 ha) of City and County of Honolulu land and 101 ac (41 ha) of State land 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 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, 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 24 ac (10 ha) of State land 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 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, 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 6 consists of 149 ac (60 ha) in the dry cliff ecosystem on the leeward side of the Waianae Mountains, on State land along the rim of Lualualei Valley from Puukanehoa 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 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). The unit is occupied by the plants *Cenchrus agrimonioides, Diellia unisora, Flueggea neowawraea, Lepidium arbuscula, Lobelia niihauensis, Melicope saint-johnii, Neraudia angulata, Plantago 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 7a consists of 68 ac (27 ha) of State land in the dry cliff ecosystem on the leeward side of the Waianae Mountains, along the rim of Lualualei Valley to Pohakea. 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 *Flueggea neowawraea, Kadua parvula, Melicope saint-johnii, Plantago 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 7a is not currently occupied by *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Alectryon macrococcus, Bonamia menziesii, 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, Korthalsella degeneri, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melanthera tenuifolia, Melicope makahae, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Pteralyxia macrocarpa, Sanicula mariversa, Schiedea hookeri, S. obovata, S. trinervis, Silene lanceolata, 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 7b consists of 38 ac (16 ha) of State land in the dry cliff ecosystem on the leeward side of the Waianae Mountains, along the rim of Lualualei Valley at Palikea. 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). Although Oahu—Dry Cliff—Unit 7b is not currently occupied by *Abutilon sandwicense, Achyranthes splendens* var. *rotundata, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, C. kuwaleana, 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, Platydesma cornuta* var. *decurrens, Pleomele forbesii, 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—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). This unit 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, 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 167 ac (68 ha) of State land, 68 ac (28 ha) of City and County of Honolulu land, and less than 1 ac (less than 1 ha) of privately owned land in the wet cliff ecosystem in the Waianae Mountains, near the summit of Kaala, and partially within the Mokuleia 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). Wet Cliff—Unit 1 is occupied by the plants *Cyanea calycina, Melicope christophersenii,* and S*chiedea 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 3 ac (1 ha) of State land in the wet cliff

ecosystem in the Waianae Mountains at Puuhapapa, 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). 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 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). This unit 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 31 ac (13 ha) of State land in the wet cliff ecosystem 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, and the unique features identified as PCEs for the Hawaiian damselflies (see Tables 4 and 5). 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 crispa, Huperzia nutans, Pteralyxia macrocarpa,* and *Schiedea kaalae,* and by 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, Plantago princeps, Psychotria hexandra* ssp. *oahuensis, Sanicula purpurea, Tetraplasandra gymnocarpa, Trematolobelia singularis,* or *Viola oahuensis,* or by 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 in 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, and the unique features identified as PCEs for the crimson and oceanic Hawaiian damselflies (see Tables 4 and 5). 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 crispa, Psychotria hexandra* ssp. *oahuensis,* and *Schiedea kaalae,* and by 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 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, Huperzia nutans, Labordia cyrtandrae, Lobelia oahuensis, Lysimachia filifolia, Phyllostegia hirsuta, P. parviflora, P. 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 1,479 ac (598 ha) of State land, 1,281 ac (519 ha) of City and County of Honolulu land, 5 ac (2 ha) of Federal land, and 1,884 ac (762 ha) of privately owned land, in the wet cliff ecosystem 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 unique for the species PCEs for the crimson and oceanic Hawaiian damselflies (see Tables 4 and 5). 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, Plantago 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 the plants *Adenophorus periens, Chamaesyce deppeana, C. rockii, Cyanea crispa, C. truncata, Psychotria hexandra* ssp. *oahuensis,* or *Schiedea kaalae,* or by the crimson and 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 regulatory 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, 442 (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 ability of the area to periodically 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 issue:

(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 final 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.) or a permit from us under section 10 of the Act), or activities involving some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). 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

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 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 physical or biological features to an extent that appreciably reduces the conservation value of critical habitat for the 124 species identified in this 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 final 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 Amendment 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 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

Lands Under U.S. Army Jurisdiction

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–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, June 17, 2003), 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 criteria, we determined in the 2003 final rule that 26,946 ac (10,905 ha) of Army lands were excluded 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 (U.S. Army 2002), Ecosystem Management Plan (U.S. 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, reviewed the Army's Wildland Fire Management Plan for Makua Military Installation (U.S. Army 2000) and the Draft Wildland Fire Management Plan for the other five Oahu installations (U.S. 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 rule.

The Army recently updated its 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 for 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 Garrison Hawaii 2003; 2008, U.S. Army Garrison Hawaii 2005c, Addendum). The implementation plans and addendum were prepared under the terms of biological opinions issued by the Service (USFWS 1999b, USFWS 2003b, 356 pp.; USFWS 2007c, 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 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, pp. 4–14, 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 listed in this final rule 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 are integrated in the INRMP (U.S. Army Garrison Hawaii 2010, pp. 4–20–4–22; 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 14 plant species that are listed in this final rule 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 8,310 ac (3,364 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 2003b, 356 pp.; U.S. Army Garrison 2005c; USFWS 2007c, 776 pp.), and the 2003 WFMP, provide conservation benefits to 14 plant species listed in this final rule 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 provides 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, 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 7B, above) (U.S. Army Garrison 2003, 2005b, 2008, 2010; USFWS 2003b, 356 pp.; USFWS 2007c, 776 pp.). Figures 1 through 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 Installation

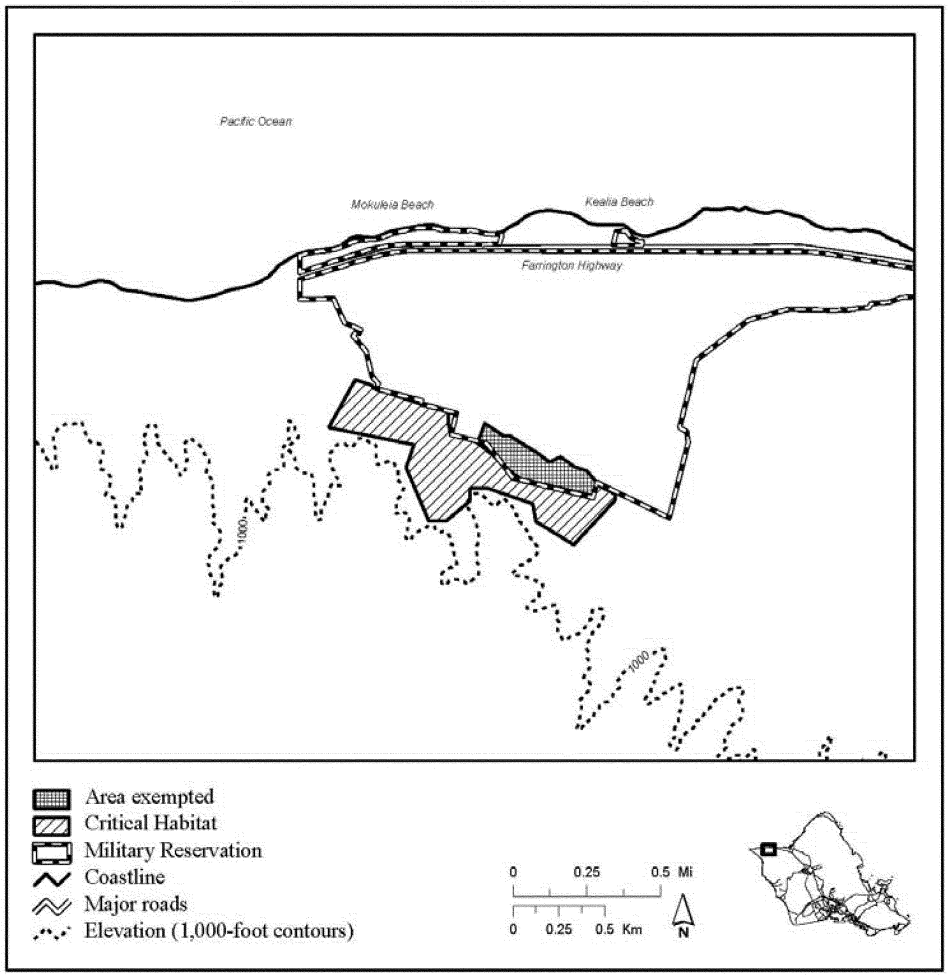


Figure 2
Kahuku Training Area

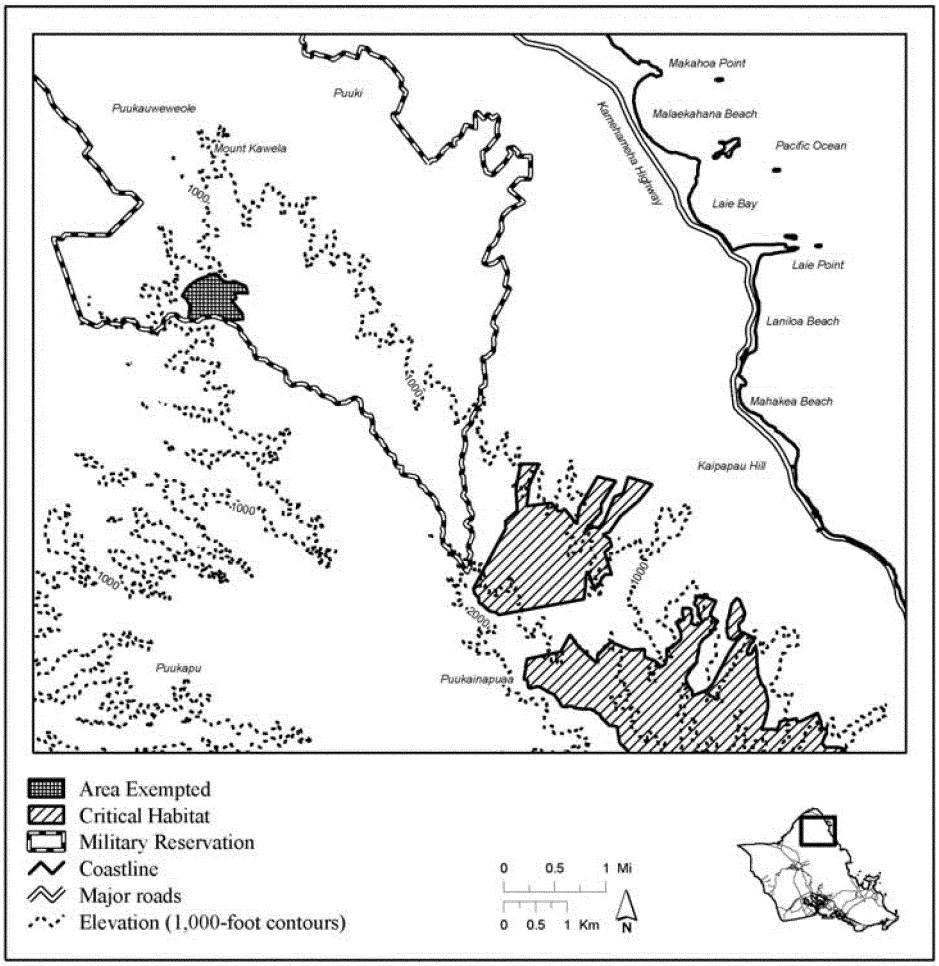


Figure 3
Kawailoa Training Area and
Schofield Barracks Military Reservation - East Range

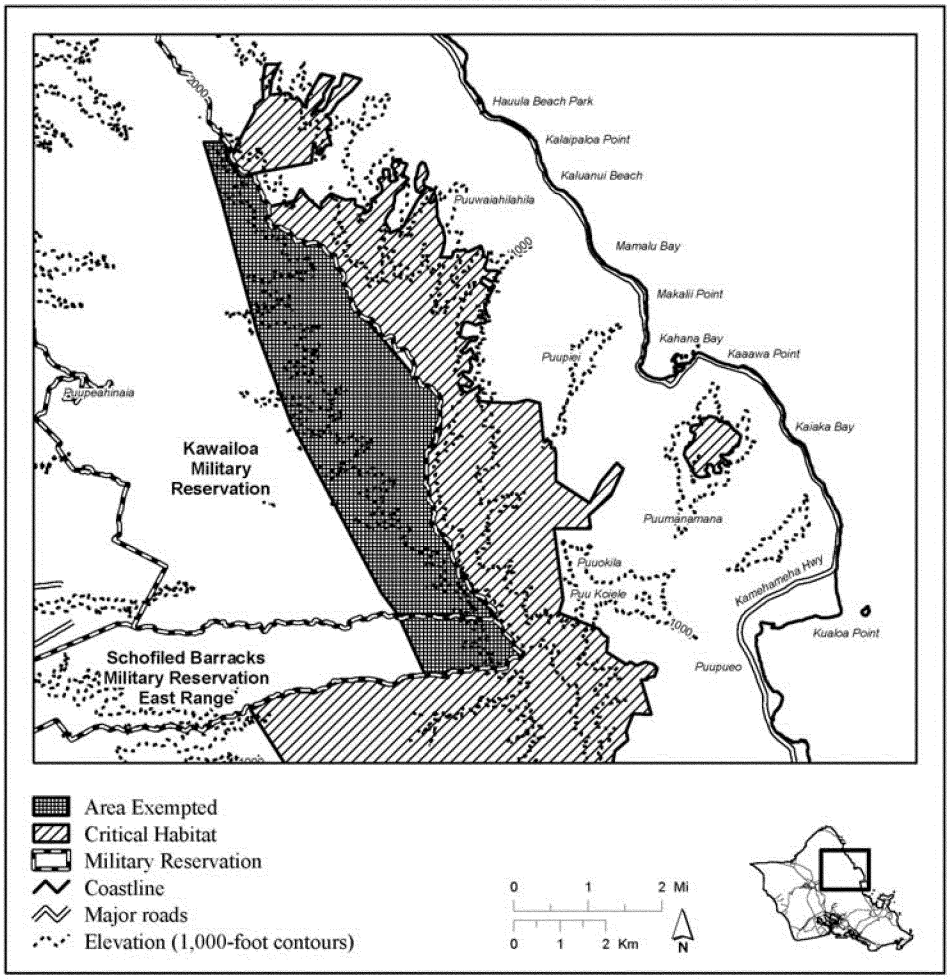
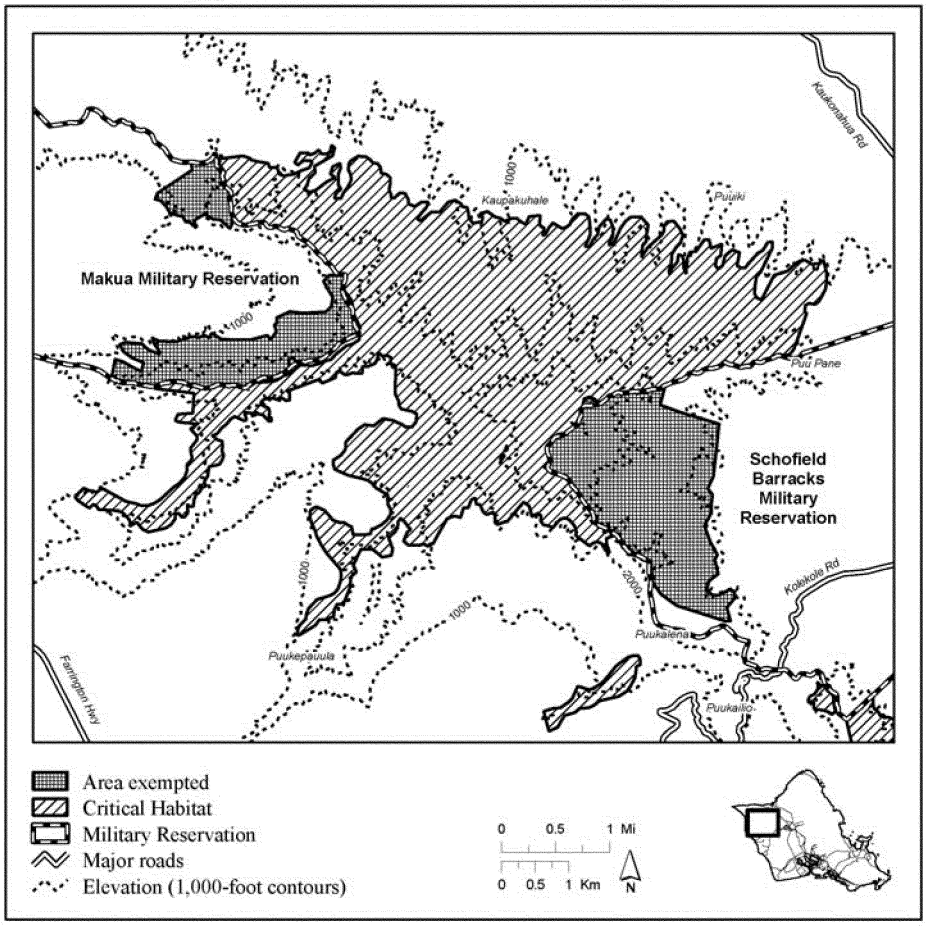


Figure 4
Makua Military Reservation and
Schofield Barracks Military Reservation



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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 radio transmitting facility. The Navy lands at Lualualei are composed of two contiguous facilities, Naval Station Pearl Harbor Lualualei Branch (NAVMAG PH Lualualei) and Naval Radar Transmittal Facility at Lualualei (NRTF Lualualei). In addition, the Navy still retains ownership of land within the former Barber's Point Naval Air Station at Kalaeloa on Oahu's southwestern coast, including 166 ac (67 ha) that are within Oahu—Lowland Dry—Unit 11. We are aware that the Navy plans to transfer ownership of these 166 ac (67 ha) to the Hawaii Community Development Authority (HCDA), although this transfer has not yet occurred (City and County Real Property Assessment Division 2011). Due to the pending land transfer, these lands were not considered for exemption from this final designation of critical habitat under section 4(a)(3)(B)(i), as the revised INRMP discussed below would not cover those lands once ownership is transferred. However, we understand that as part of the land transfer negotiations, a draft conservation plan is being specifically developed for this area.

In our June 17, 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, M. 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 revision to their 2001 INRMP, which was completed in September 2011 (2011 Joint Base Pearl Harbor-Hickam INRMP), following the publication of our August 2011 proposed rule (76 FR 46362). Since it was not completed at the time of our August 2011 proposed rule, we conducted an analysis of the Navy's 2001 INRMP to determine whether it provided a conservation benefit to the plant species for which critical habitat was proposed on Navy lands, for purposes of section 4(a)(3)(B)(i) of the Act. In our proposed, rule we determined that the Navy's 2001 INRMP did not provide a conservation benefit for previously listed species or for those species proposed for listing for which we found critical habitat to be

both prudent and determinable. As a result, we proposed critical habitat for 60 plant species within 9 units that overlap Navy lands at Lualuaei Valley (Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Wet Cliff—Unit 2, and Oahu—Wet Cliff—Unit 5) and in 1 unit that overlaps Navy lands at Kalaeloa Barber's Point (Oahu—Lowland Dry—Unit 11). Within these 10 units, 28 species occur within one or more of the units (occupied units) and 32 species are not currently known to occur within one or more of the units (unoccupied units) (Table 8).

TABLE 8—SPECIES FOR WHICH CRITICAL HABITAT WAS PROPOSED AT NAVMAG PH LUALUALEI, NRTF LUALUALEI AND KALAELOA BARBER'S POINT

Species	Unit occupied	Unoccupied
Abutilon sandwicense	Oahu—Dry Cliff—Unit 7	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Achyranthes splendens var. *rotundata*.		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry —Unit 5, Oahu—Lowland Dry —Unit 11
Alectryon macrococcus	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5	Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Bidens amplectens		Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry —Unit 5, Oahu—Lowland Dry —Unit 11
Bonamia menziesii		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry —Unit 5, Oahu—Lowland Dry —Unit 11
Cenchrus agrimonioides	Oahu—Dry Cliff—Unit 6	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Chamaesyce celastroides var. *kaenana*.		Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry —Unit 5, Oahu—Lowland Dry —Unit 11
Chamaesyce herbstii		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Chamaesyce kuwaleana	Oahu—Dry Cliff—Unit 4	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Chamaesyce skottsbergii var. *skottsbergii*.	Oahu—Lowland Dry—Unit 11	Oahu—Lowland Dry—Unit 11
Cyanea acuminata		Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 5
Cyanea calycina	Oahu—Wet Cliff—Unit 2	Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 5
Cyanea grimesiana ssp. *obatae*.		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Cyperus trachysanthos	Oahu—Lowland Dry—Unit 5	Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5
Cyrtandra dentata		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Diellia falcata		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Diellia unisora	Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Dubautia herbstobatae		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Eragrostis fosbergii		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Euphorbia haeleeleana		Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry —Unit 5, Oahu—Lowland Dry—Unit 11
Flueggea neowawraea	Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7.	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6
Gouania meyenii		Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 11, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Gouania vitifolia		Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 11, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Hibiscus brackenridgei		Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 11

TABLE 8—SPECIES FOR WHICH CRITICAL HABITAT WAS PROPOSED AT NAVMAG PH LUALUALEI, NRTF LUALUALEI AND KALAELOA BARBER'S POINT—Continued

Species	Unit occupied	Unoccupied
Isodendrion laurifolium		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Isodendrion pyrifolium		Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 11, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Kadua degeneri		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Kadua parvula	Oahu—Dry Cliff—Unit 7	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Korthalsella degeneri		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Labordia cyrtandrae		Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 5
Lepidium arbuscula	Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Lipochaeta lobata var. *leptophylla*.	Oahu—Dry Cliff—Unit 5	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Lobelia niihauensis	Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Lobelia oahuensis		Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 5
Marsilea villosa	Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4.	Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5
Melanthera tenuifolia		Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 11, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Melicope christophersenii	Oahu—Wet Cliff—Unit 2	Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 5
Melicope makahae		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Melicope saint-johnii	Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Neraudia angulata	Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7.	Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Nototrichium humile	Oahu—Dry Cliff—Unit 5	Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 11, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Peucedanum sandwicense		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Phyllostegia hirsuta		Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 5
Phyllostegia kaalaensis		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Plantago princeps	Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Platydesma cornuta var. *decurrens*.	Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 7	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Pleomele forbesii	Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7.	Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 11, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Pteralyxia macrocarpa	Oahu—Dry Cliff—Unit 6	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 5
Sanicula mariversa		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Schiedea hookeri	Oahu—Dry Cliff—Unit 5	Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 11, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 5
Schiedea kaalae		Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 5

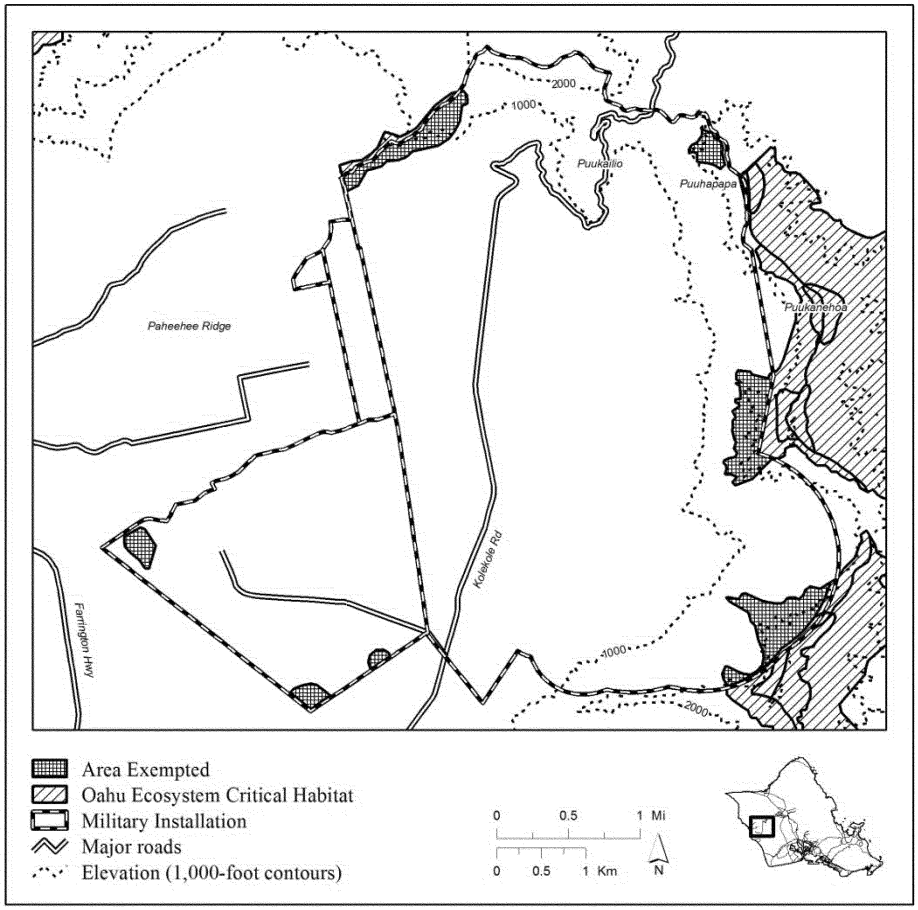
TABLE 8—SPECIES FOR WHICH CRITICAL HABITAT WAS PROPOSED AT NAVMAG PH LUALUALEI, NRTF LUALUALEI AND KALAELOA BARBER'S POINT—Continued

Species	Unit occupied	Unoccupied
Schiedea kealiae		Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 11
Schiedea obovata		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Schiedea trinervis		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7, Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 5
Silene lanceolata		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Silene perlmanii	Oahu—Dry Cliff—Unit 7	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Spermolepis hawaiiensis	Oahu—Dry Cliff—Unit 4	Oahu—Lowland Dry—Unit 3, Oahu—Lowland Dry—Unit 4, Oahu—Lowland Dry—Unit 5, Oahu—Lowland Dry—Unit 11, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Tetramolopium filiforme		Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Tetramolopium lepidotum ssp. *lepidotum.*	Oahu—Dry Cliff—Unit 6	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7
Viola chamissoniana ssp. *chamissoniana.*	Oahu—Dry Cliff—Unit 7	Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 5, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7

On June 8, 2012, the Navy provided an Addendum to its 2011 Joint Base Pearl Harbor-Hickam INRMP. In the Addendum, the Navy provides additional information regarding primary strategies of the INRMP to meet management goals at Lualualei and additional details regarding progress made on planned projects for endangered plants found on Navy lands at Lualualei. These additional objectives or amended action or actions in progress include: (1) A survey documenting numbers and locations of endangered plant species; (2) identification of an additional population of Marsilea villosa in the Radio Transmitting Facility; (3) development of a M. villosa management plan based on recommendation strategies outlined in a dissertation, partly funded by the Navy; (4) expansion of funding for a fencing plan and fence construction for ungulate control; (5) completion of aerial surveys for feral goats, with plans for their removal beginning in 2013; (6) nonnative plant removal within exclosures at Halona and Mikiula management areas; (7) allocation of funding for research on black twig borer control methods; (8) prioritization of production of a wildfire management plan; (9) request of permission through the chain of command to outplant endangered and threatened species to augment and stabilize populations within Navy property at Lualualei; and (10) allocated funding for development and implementation of a *Chamaesyce skottsbergii* var. *skottsbergii* management plan on Navy lands at Kalaeloa. In summary, the Navy has made progress in identifying needed management actions, recognizing the need for monitoring plans, increasing initial determinations of funding required for natural resource management, and recognizing the need for propagation and outplanting of endangered and threatened plant species on their lands.

The exemption of Navy lands from this final rule is based on our review and analysis to determine whether the area was subject to a current and final INRMP that provides a conservation benefit to the species. To evaluate whether the INRMP provides a benefit to the species, we considered (1) whether the INRMP covered the areas identified as critical habitat for the species. After applying the above three criteria, we determine that the Navy's 2011 INRMP for Joint Base Pearl Harbor-Hickam and 2012 addendum provide conservation benefits to 60 listed plant species that occur within the NAVMAG PH Lualualei and NRTF Lualualei. As a result, we have exempted 380 ac (154 ha) of Navy lands within the NAVMAG PH Lualualei and NRTF Lualualei from this final designation of critical habitat for those species under section 4(a)(3)(B)(i) of the Act. Figure 5 identifies the above areas on Navy-managed lands that were evaluated under section 4(a)(3)(B)(i) of the Act.

Figure 5
NRTF Lualualei Military Reservation and
NAVMAG Pearl Harbor Lualualei Military Reservation



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.

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 prepared a draft economic analysis (DEA) of the critical habitat designation and related factors (77 FR 21936, April 21, 2012). The DEA, dated April 12, 2012, was made available for public review from April 12 through May 14, 2012 (77 FR 21936). Following the close of the comment period, a final analysis (dated July 27, 2012) of the potential economic effects of the designation was developed taking into consideration the public comments and any new information (USFWS 2012b). Substantive comments and information received on the DEA are summarized in the Summary of Comments and Recommendations section above.

The intent of the final economic analysis (FEA) is to quantify the economic impacts of all potential conservation efforts for the 124 species; some of these costs will likely be incurred regardless of whether we designate critical habitat (baseline). The economic impact of the final critical habitat designation is analyzed by comparing scenarios both ''with critical habitat'' and ''without critical habitat.'' The ''without critical habitat'' scenario represents the baseline for the analysis, considering protections already in place for the species (e.g., under the Federal listing and other Federal, State, and local regulations). The baseline, therefore, represents the costs incurred regardless of whether critical habitat is designated. The ''with critical habitat'' scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat for the species. In other words, the incremental costs are those attributable solely to the designation of critical habitat above and beyond the baseline costs; these are the costs we consider in the final designation of critical habitat. The analysis looks at baseline impacts expected to occur due to listing of these 124 species, and forecasts both baseline and incremental impacts likely to occur with the designation of critical habitat for 25 species and revision of critical habitat for 99 plant species.

The FEA also addresses how potential economic impacts are likely to be distributed, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation activities on government agencies, private businesses, and individuals. The FEA measures lost economic efficiency associated with residential and commercial development and public projects and activities, such as economic impacts on water management and transportation projects, Federal lands, small entities, and the energy industry. Decision-makers can use this information to assess whether the effects of the designation might unduly burden a particular group or economic sector. Finally, the FEA looks and considers those costs that may occur in the 20 years following listing of the 23 species; designation of critical habitat for these 23 species and *Achyranthes splendens* var. *rotundata* and *Chamaesyce skottsbergii* var. *skottsbergii;* and costs attributed to revision of critical habitat for the 99 plant species which was determined to be the appropriate period for analysis because limited planning information was available for most activities to forecast activity levels for projects beyond a 20-year timeframe. The FEA quantifies economic impacts of conservation efforts for the 124 species associated with the following categories of activity, which represent typical conservation measures or conservation recommendations the Service may request or suggest during section 7 consultation for projects that may affect critical habitat for listed plants at Kalaeloa: Installation of silt fencing to control erosion on construction sites; containment of construction site surface runoff to avoid contamination of native plants; establishement of buffer zones around fenced areas where plants are located; cleaning procedures to reduce the introduction of non-native plants; and prohibiting the importation of earthen soil from off-site to reduce the introduction of non-native seeds (USFWS 2012b, p. 12). Baseline impacts include the potential economic impacts of all actions relating to the conservation of the 124 species, including costs associated with sections 7, 9, and 10 of the Act. Baseline impacts also include the economic impacts of protective measures taken as a result of other Federal, State, and local laws that aid habitat conservation in the area evaluated in the DEA. In other words, baseline impacts include those impacts associated with the listing of the 23 species and not associated with critical habitat, costs associated with the already listed *Achyranthes splendens* var. *rotundata* and *Chamaesyce skottsbergii* var. *skottsbergii,* and costs associated with critical habitat designated in 2003 for the 99 plants. Incremental impacts are those potential future economic impacts of conservation actions relating to the designation of critical habitat for the 25 species; these impacts would not be expected to occur without the designation of critical habitat. In addition, incremental impacts include potential future economic impacts of conservation actions relating to the revised critical habitat for the 99 plants.

Baseline economic impacts are those impacts that result from listing and conservation efforts for the 23 species, listed status of *Achyranthes splendens* var. *rotundata* and *Chamaesyce skottsbergii* var. *skottsbergii,* and from the designation of critical habitat for the 99 plant species in 2003. The upper bound of administrative costs and conservation efforts to the Service, Federal agency, and third parties related to section 7 consultation in occupied critical habitat constitute the majority of total baseline costs (approximately 72 percent). Total future baseline impacts are estimated to be $105,000, which equates to (1) $54,178 in present value terms using a 7 percent discount rate over the next 20 years (2011 to 2031); (2) $77,075 in present value terms using a 3 percent discount rate over the next 20 years; or (3) $5000 annualized over the next 20 years.

The upper bound of administrative costs and conservation efforts to the Service, Federal agency, and third parties related to section 7 consultation in unoccupied critical habitat constitute the majority of total incremental costs (approximately 28 percent). Total future incremental impacts are estimated to be $40,000 over the next 20 years (2011 to 2031). Annualized incremental administrative in present value terms using a 7 percent discount rate over the next 20 years is $3,692, or $1,905 using a 3 percent discount rate.

The FEA estimates total upper bound potential economic impacts in areas proposed as critical habitat over the next 20 years (2011 to 2031) to be $145,000, which equates to (1) $94,178 in present value terms using a 7 percent discount rate over the next 20 years (2011 to 2031); (2) $117,075 in present value terms using a 3 percent discount rate over the next 20 years; (3) $5000 annualized using a 7 percent discount rate over the next 20 years, or (4) $6,905 using a 3 percent discount rate over the next 20 years. This value is based on an assumption of total avoidance of designated acres and thus represents the upper-bound potential cost for each project. As such, it likely overstates the expected absolute cost of future actions to protect critical habitat.

The FEA considers both economic efficiency and distributional effects. In the case of habitat conservation, efficiency effects generally reflect the ''opportunity costs'' associated with the commitment of resources to comply with habitat protection measures (such as lost economic opportunities associated with restrictions on land use). The FEA also addresses how potential economic impacts are likely to be distributed, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation activities on government agencies, private businesses, and individuals. Decision-makers can use this information to assess whether the effects of critical habitat designation might unduly burden a particular group or economic sector.

Our economic analysis did not identify any disproportionate costs that are likely to result from the designation. Consequently, the Secretary has determined not to exercise his discretion to exclude any areas from this designation of critical habitat for the 124 species based on economic impacts.

A copy of the FEA with supporting documents may be obtained by contacting the Pacific Islands Fish and Wildlife Office (see **ADDRESSES**) or by downloading from the Internet at *http://www.regulations.gov*.

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 final rule, we have exempted from the designation of critical habitat those DOD lands with completed INRMPs determined to provide a benefit to the 124 species. We have determined that certain lands owned or managed by the DOD (Department of the Navy) at Kalaeloa Barber's Point are not being exempted from the designation of critical habitat (see discussion under ''*Approved INRMPs,* above''); however, Navy lands at NAVMAG PH Lualuaei Branch and NRFT Lualualei are exempted from designation as critical habitat under section 4(a)(3)(B)(i) of the Act. There are also lands owned or managed at six Department of the Army training installations (see discussion under ''*Approved INRMPs,* above'') that are exempted from designation as critical habitat under section 4(a)(3)(B)(i) of the Act. We are unaware of any potential impacts to national security on any DOD lands; therefore, we are not excluding any areas from critical habitat designation based on impacts to national security.

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 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 listed as endangered in this rule. 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, habitat conservation plants (HCPs), or other management plans from this critical habitat designation. Accordingly, we do not exert our discretion to exclude any areas from final critical habitat designation based on other relevant impacts.

In conclusion, the Secretary will not be exercising his discretion under section 4(b)(2) of the Act to exclude any particular area from this final rule, based on the conservation value of these areas.

Required Determinations

These required determinations relate to the portion of this rule designating critical habitat. Listing determinations must be made solely on the basis of the best scientific and commercial data available. 16 U.S.C. 1533(b)(1)(A).

Regulatory Planning and Review—Executive Orders 12866 and 13563

Executive Order (E.O.) 12866 provides that the Office of Information and Regulatory Affairs (OIRA) will review all significant rules. The OIRA has determined that this rule is not significant.

E.O. 13563 reaffirms the principles of E.O. 12866 while calling for improvements in the nation's regulatory system to promote predictability, to reduce uncertainty, and to use the best, most innovative, and least burdensome tools for achieving regulatory ends. The executive order directs agencies to consider regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public where these approaches are relevant, feasible, and consistent with regulatory objectives. E.O. 13563 emphasizes further that regulations must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this rule in a manner consistent with these requirements.

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

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.*), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 (5 U.S.C. 801 *et seq.*), an agency 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 an agency certifies the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the RFA to require Federal agencies to provide a certification statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities. In this final rule, we are certifying that the critical habitat designation for the 124 Oahu species will not have a significant economic impact on a substantial number of small entities. The following discussion explains our rationale.

According to the Small Business Administration, small entities include small organizations, such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; and small businesses (13 CFR 121.201). Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than $5 million in annual sales, general and heavy construction businesses with less than $27.5 million in annual business, special trade contractors doing less than $11.5 million in annual business, and agricultural businesses with annual sales less than $750,000. To determine if potential economic impacts to these small entities are significant, we considered the types of activities that

might trigger regulatory impacts under this designation as well as 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.

Designation of critical habitat only affects activities authorized, funded, or carried out by Federal agencies. Some kinds of activities are unlikely to have any Federal involvement and so will not be affected by critical habitat designation. In areas where one or more of the 124 species are present, Federal agencies already are required to consult with us under section 7 of the Act on activities they authorize, fund, or carry out that may affect the species. Federal agencies also must consult with us if their activities may affect critical habitat. Designation of critical habitat, therefore, could result in an additional economic impact on small entities due to the requirement to reinitiate consultation for ongoing Federal activities (see *Application of the ''Adverse Modification'' Standard* section).

Under the RFA, as amended, and following recent court decisions, Federal agencies are only required to evaluate the potential incremental impacts of rulemaking on those entities directly regulated by the rulemaking itself, and not the potential impacts to indirectly affected entities. The regulatory mechanism through which critical habitat protections are realized is section 7 of the Act, which requires Federal agencies, in consultation with the Service, to insure that any action authorized, funded, or carried by the Agency is not likely to adversely modify critical habitat. Therefore, only Federal action agencies are directly subject to the specific regulatory requirement (avoiding destruction and adverse modification) imposed by critical habitat designation. Under these circumstances, it is our position that only Federal action agencies will be directly regulated by this designation. Therefore, because Federal agencies are not small entities, the Service may certify that the proposed critical habitat rule will not have a significant economic impact on a substantial number of small entities.

We acknowledge, however, that in some cases, third-party proponents of the action subject to permitting or funding may participate in a section 7 consultation, and thus may be indirectly affected. We believe it is good policy to assess these impacts if we have sufficient data before us to complete the necessary analysis, whether or not this analysis is strictly required by the RFA. While this regulation does not directly regulate these entities, in our final economic analysis, we have conducted an evaluation of the potential third parties participating in consultations on an annual basis, in order to ensure a more complete examination of the incremental effects of this rule in the context of the RFA.

We are specifically aware of some potential development activities in the Barber's Point area, which could potentially affect the following critical habitat units: Oahu—Coastal—Unit 13, Oahu—Coastal—Unit 14, Oahu—Coastal—Unit 15, Oahu—Lowland Dry—Unit 8; Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11. These potential development activities were evaluated in the final economic analysis. Kapolei West is a master planned development within Oahu—Lowland Dry—Unit 8 that includes resort, mixed use residential, and commercial components. Kapolei Harborside is also within Oahu—Lowland Dry—Unit 8, and is part of a larger Kapolei Business-Industrial Park development. Within units Oahu—Lowland Dry—Unit 9 and Oahu—Coastal—Unit 15, there are plans to construct approximately 28,000 square feet of non-residential development over the next 7 to 20 years. The Kalaeloa Master Plan classifies this area as eco-industrial for planning purposes, targeting environmentally compatible industries (e.g., solar or hybrid energy generation, bio-filtration, or other related types of industries). Property owners within Oahu—Lowland Dry—Unit 10 have active permits to construct a large scale solar array field, and the Kalaeloa Master Plan projects this parcel to support approximately 137,000 square feet of non-residential development within the next 7 to 20 years. Oahu—Lowland Dry—Unit 11 is identified as a location for residential and non-residential development, and an energy generation project.

None of the other designated 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 designated 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 planned projects, land uses, and activities that could affect the 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 non-native 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 designated as critical habitat 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 designated 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 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 listed species 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 designating critical habitat on a total of 42,804 ac (17,322 ha) of land. Ninety-three percent (40,447 ac (16,369 ha)) of this critical habitat designation is already designated critical habitat for one or more species and 7 percent (3,044 ac (1,231 ha)) of the designation is on land newly designated as critical habitat. Some of the Federal actions that were subject to previous section 7 consultation are on the lands we are designating as critical habitat in this final rule. Therefore, there may be a requirement to reinitiate consultation for some ongoing Federal projects. However, as the consultations described above do not generally involve small entities, the requirement to reinitiate existing consultations is not likely to affect a significant number of small entities.

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 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 critical habitat designation is further evidence that this designation will not have a significant economic impact on a substantial number of small entities.

In our final economic analysis of the critical habitat designation, we evaluated the potential economic effects on small business entities resulting from implementation of conservation actions related to the designation of critical habitat for 124 Oahu species. The analysis identifies the estimated incremental impacts associated with the proposed rulemaking, as described in the Small Business Analysis Appendix Part II of the analysis, and evaluates the potential for economic impacts related to the building construction industry. The analysis concludes that it is unlikely that every affected developer would be a small business as defined by the Small Business Administration. However, because it is difficult to predict which developers would be specifically impacted by the designation of critical habitat, the analysis conservatively assumes that every developer impacted is a small business, likely overstating the economic impacts of the designation. The analysis also conservatively assumes that one developer is associated with each affected land parcel. The analysis concluded that two small business developers would be affected within in the unoccupied unit Oahu—Lowland Dry—Unit 8, and 21 small business developers would be affected in the other occupied units. Key assumptions used in the Small Business Impact Analysis were that (1) Every parcel would have one formal section 7 consultation; (2) parcels in the unoccupied unit Oahu—Lowland Dry—Unit 8 would incur property value losses; (3) a unique developer is associated with each parcel; and (4) each established reported in census data reflects a unique business. However, it is highly unlikely that every parcel would have a formal consultation because some parcels may have no consultations or only informal consultations, and every parcel is unlikely to have a Federal nexus. It is also highly unlikely the parcels in the unoccupied unit Oahu—Lowland Dry—Unit 8 would incur property value losses, since development activities that with a Federal nexus that do not adversely modify critical habitat are not

prohibited. Likewise, it is highly unlikely that a unique developer is associated with each parcel, since more than one parcel is likely to be included in a single action and developers are likely to be involved in more than a single project. It is unlikely that each establishment reported in census data reflects a unique business, since a single business can be composed of one or more establishments. Accordingly, the effect of taking the above assumptions into consideration in the final economic analysis overestimates the effect of the designation on small businesses (i.e., reflects the upper bound of economic impact). Table 4 in Part II of the Final Economic Analysis concludes that the upper bound of economic impacts to small businesses as follows: (1) Property Value Impacts (based on a total property value impact (upper-bound) of $7,620,971 for the two unoccupied parcels in LDU8)—2 firms could potentially be affected, and realize a $351,666 average annualized property value impact at a 7 percent discount rate ($247,193 at a 3 percent discount rate), based on average receipts of $14,673,156. This equates to an annualized property value impact of 2.4 percent at a 7% discount rate, or 1.7 percent at a 3 percent discount rate. Two businesses is not a substantial number of businesses impacted, and the annualized property impacts are not significant; (2) Administrative Impacts—23 firms could potentially be affected, accruing a $3,500 cost related to section 7 consultation (2 percent of their averaged annualized receipts), which is not a significant impact. Incremental impacts are either not expected for the other types of activities considered or, if expected, will not be borne by small entities.

In summary, we considered whether the rule will result in a significant economic impact on a substantial number of small entities. For the above reasons and based on currently available information, we conclude that this rule will not result in a significant economic impact on a substantial number of small entities. Therefore, we are certifying that the designation of critical habitat for 124 Oahu species will not have a significant impact on a substantial number of small entities, and a regulatory flexibility analysis is not required.

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

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501), 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 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 does not apply, nor does critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(b) We do not believe that this rule will significantly or uniquely affect small governments. The lands we are designating as critical habitat 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.

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 42,804 ac (17,322 ha) of lands in Honolulu County, Hawaii, as critical habitat for the 124 species in a takings implications assessment. The takings implications assessment concludes that this designation of critical habitat for each of these 124 species does not pose significant takings implications for lands within or affected by the designation.

Federalism—Executive Order 13132

In accordance with E.O. 13132 (Federalism), this rule does not have significant Federalism effects. A federalism summary impact statement is not required. In keeping with Department of the Interior and Department of Commerce policy, we requested information from, and coordinated development of, this 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) will 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 Executive Order 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 designated critical habitat in accordance with the provisions of the Act. This final rule uses standard property descriptions and identifies the features essential to the conservation of the species within the designated areas to assist the public in understanding the habitat needs of each of the 124 species considered in this rule.

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

This rule does not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). This rule does not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act (NEPA)

It is our position that, outside the jurisdiction of the Circuit Court of the United States for the Tenth Circuit, we do not need to prepare environmental analyses as defined by NEPA (42 U.S.C. 4321 *et seq.*) in connection with designating critical habitat under the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This 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)).

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations With Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments), 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 that are essential for the conservation of the 124 Oahu species. Therefore, we have not designated critical habitat for any of the 124 species on tribal lands.

Energy Supply, Distribution, and Use—Executive Order 13211

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 rule designating 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. Regarding the proposed solar development project in Oahu—Lowland Dry—Unit 10, we do not foresee a Federal nexus for the specific project proposal, and, therefore, the designation of critical habitat is not anticipated to impact that project. Regarding the additional solar development project in Oahu—Lowland Dry—Unit 11, we support the development of a balanced conservation plan or State habitat conservation plan, which the Navy requires as a deed transfer restriction, in order to complete the proposed land transfer to the State of Hawaii. Further, we support the balanced approach planned by the Navy and the State that will allow the solar project to go forward in a portion of Oahu—Lowland Dry—Unit 11, as well as the conservation of *Chamaesyce skottsbergii* var. skottsbergii on the site. Therefore, since this designation of critical habitat is not anticipated to impact any of the proposed renewable energy projects, this action is not a significant energy action, and no Statement of Energy Effects is required.

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.

References Cited

A complete list of all references cited in this rulemaking is available on the *http://www.regulations.gov* and upon request from the Pacific Islands Fish and Wildlife Office (see **ADDRESSES**).

Authors

The primary authors of this rulemaking are staff members of the Pacific Island Fish and Wildlife Office (see **ADDRESSES**).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we 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	806	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	806	17.99(i)	NA
*	*	*	*	*	*		*
Cyanea lanceolata	Haha	U.S.A. (HI)	Campanulaceae	E	806	17.99(i)	NA
*	*	*	*	*	*		*
Cyanea purpurellifolia.	Haha	U.S.A. (HI)	Campanulaceae	E	806	17.99(i)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*		*
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	806	17.99(i)	NA
Cyrtandra kaulantha	Haiwale	U.S.A. (HI)	Gesneriaceae	E	806	17.99(i)	NA
*	*	*	*	*	*		*
Cyrtandra sessilis	Haiwale	U.S.A. (HI)	Gesneriaceae	E	806	17.99(i)	NA
*	*	*	*	*	*		*
Cyrtandra waiolani	Haiwale	U.S.A. (HI)	Gesneriaceae	E	806	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	806	17.99(i)	NA
*	*	*	*	*	*		*
Melanthera tenuifolia	Nehe	U.S.A. (HI)	Asteraceae	E	448	17.99(i)	NA
*	*	*	*	*	*		*
Melicope christophersenii.	Alani	U.S.A. (HI)	Rutaceae	E	806	17.99(i)	NA
*	*	*	*	*	*		*
Melicope hiiakae	Alani	U.S.A. (HI)	Rutaceae	E	806	17.99(i)	NA
*	*	*	*	*	*		*
Melicope makahae	Alani	U.S.A. (HI)	Rutaceae	E	806	17.99(i)	NA
*	*	*	*	*	*		*
Platydesma cornuta var. *cornuta.*	None	U.S.A. (HI)	Rutaceae	E	806	17.99(i)	NA
Platydesma cornuta var. *decurrens.*	None	U.S.A. (HI)	Rutaceae	E	806	17.99(i)	NA
*	*	*	*	*	*		*
Pleomele forbesii	Hala pepe	U.S.A. (HI)	Asparagaceae	E	806	17.99(i)	NA
*	*	*	*	*	*		*
Psychotria hexandra ssp. *oahuensis.*	Kopiko	U.S.A. (HI)	Rubiaceae	E	806	17.99(i)	NA
*	*	*	*	*	*		*
Pteralyxia macrocarpa.	Kaulu	U.S.A. (HI)	Apocynaceae	E	806	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	806	17.99(i)	NA
*	*	*	*	*	*		*
Zanthoxylum oahuense.	Ae	U.S.A. (HI)	Rutaceae	E	806	17.99(i)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*		*
FERNS AND ALLIES							
*	*	*	*	*	*		*
Doryopteris takeuchii	None	U.S.A. (HI)	Pteridaceae	E	806	17.99(i)	NA
*	*	*	*	*	*		*
Huperzia nutans	Wawaeiole	U.S.A. (HI)	*Lycopodiaceae*	E	467	17.99(e)(1) and (i)	NA
*	*	*	*	*	*		*

■ 4. Amend § 17.95(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.

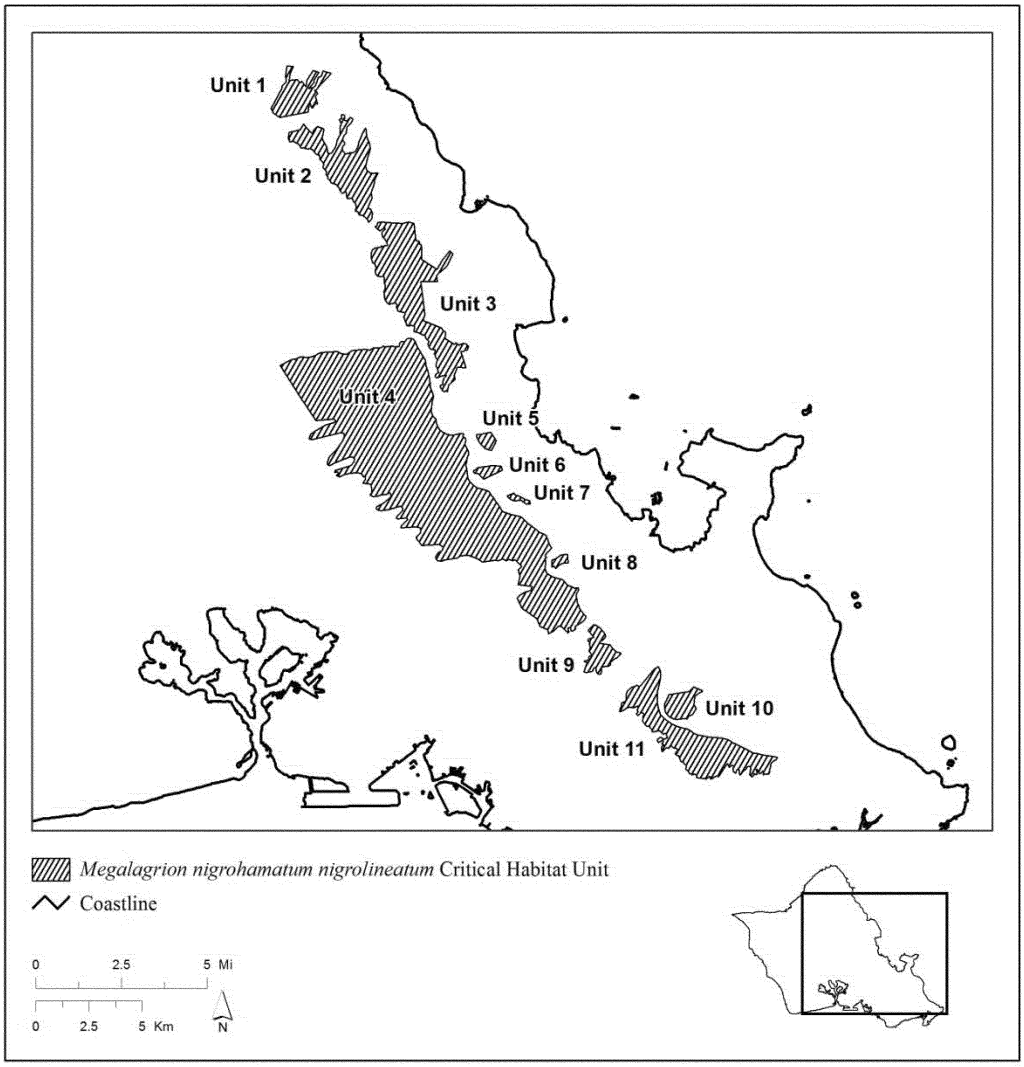
(3) Existing manmade features and structures, such as buildings, roads, railroads, airports, runways, other paved areas, lawns, and other urban landscaped areas, existing trails, campgrounds and their immediate surrounding landscaped area, scenic lookouts, remote helicopter landing sites, and existing fences are not included in the critical habitat designation. 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 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). The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site, *http://www.fws.gov/pacificislands*; at *http://www.regulations.gov* at Docket No. FWS–R1–ES–2010–0043: and at the field office responsible for the designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) Index map of critical habitat units for the blackline Hawaiian damselfly (*Megalagrion nigrohamatum nigrolineatum*) follows:

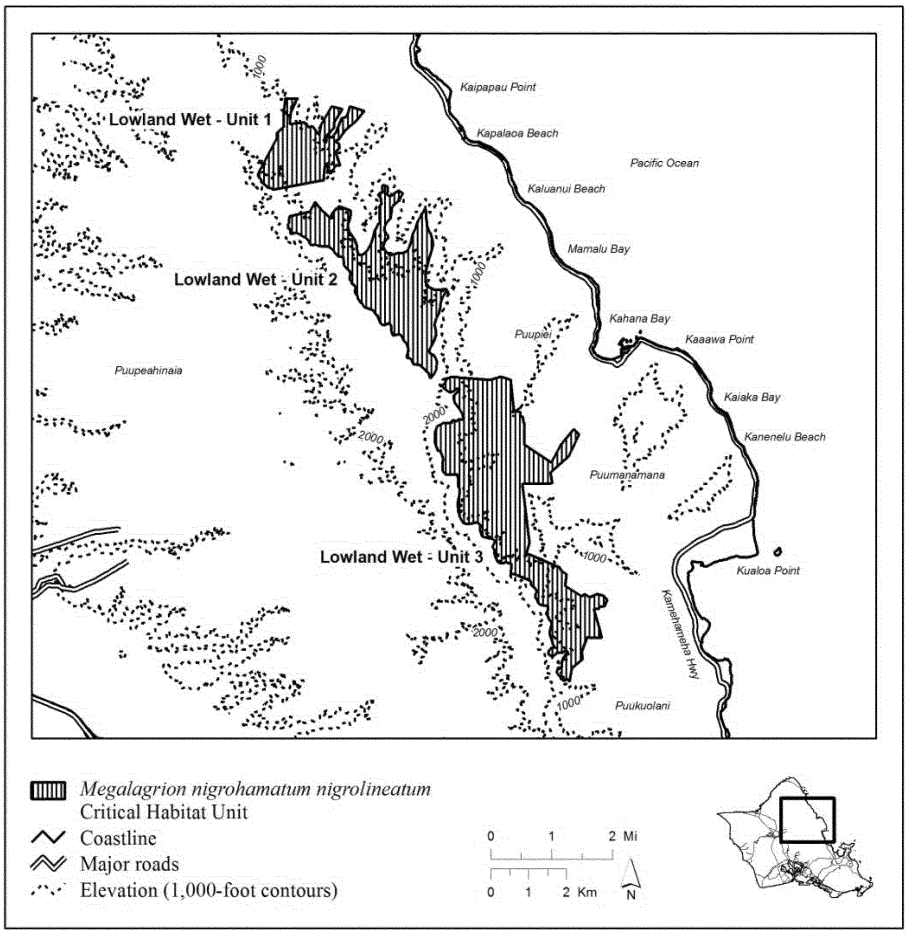
BILLING CODE 4310–55–P

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



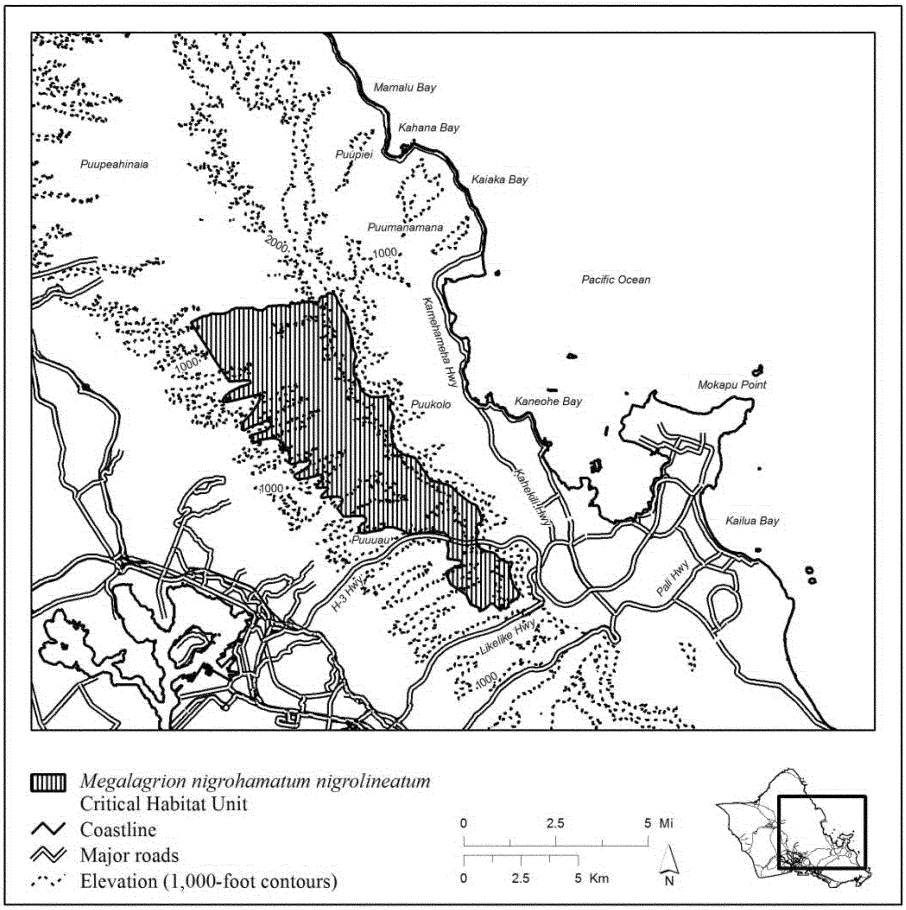
(6) *Megalagrion nigrohamatum nigrolineatum*—Unit 1—Lowland Wet, Honolulu County, Hawaii (790 ac; 320 ha); *Megalagrion nigrohamatum nigrolineatum*—Unit 2—Lowland Wet, Honolulu County, Hawaii (1,787 ac; 723 ha); and *Megalagrion nigrohamatum nigrolineatum*—Unit 3—Lowland Wet, Honolulu County, Hawaii (3,041 ac; 1,231 ha). These units are critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.* 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



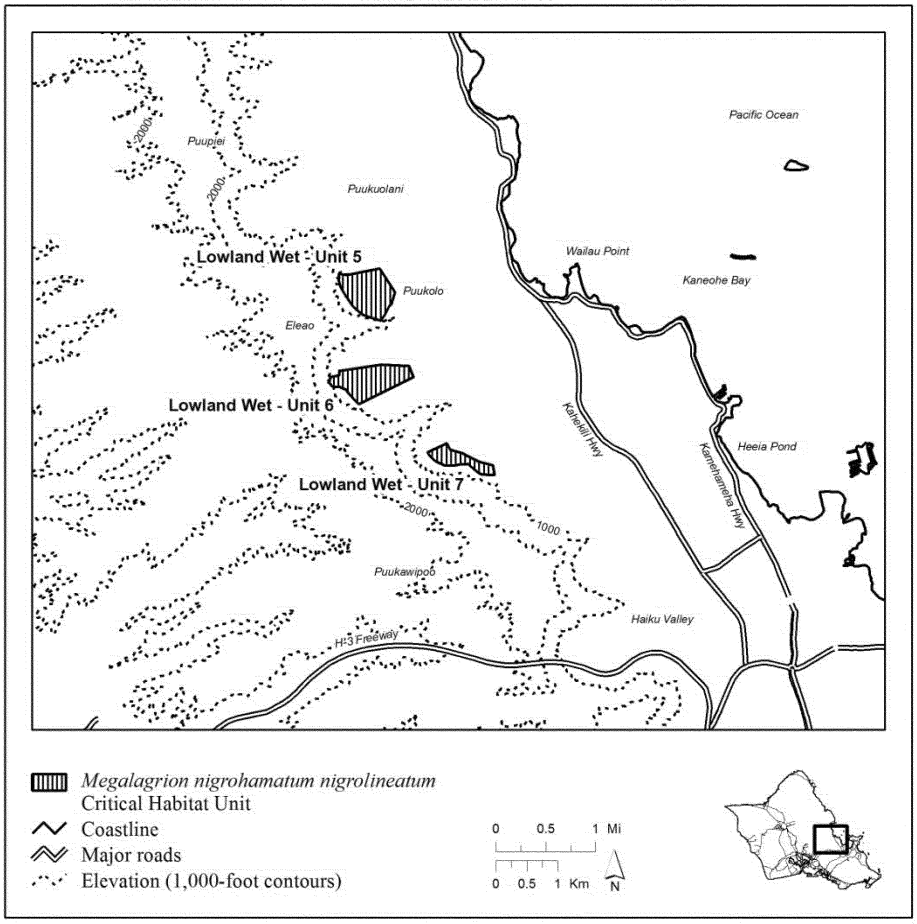
(7) *Megalagrion nigrohamatum nigrolineatum*—Unit 4—Lowland Wet, Honolulu County, Hawaii (15,728 ac; 6,365 ha). This unit is critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.* Map of *Megalagrion nigrohamatum nigrolineatum*—Unit 4—Lowland Wet follows:

Megalagrion nigrohamatum nigrolineatum
Lowland Wet
Unit 4



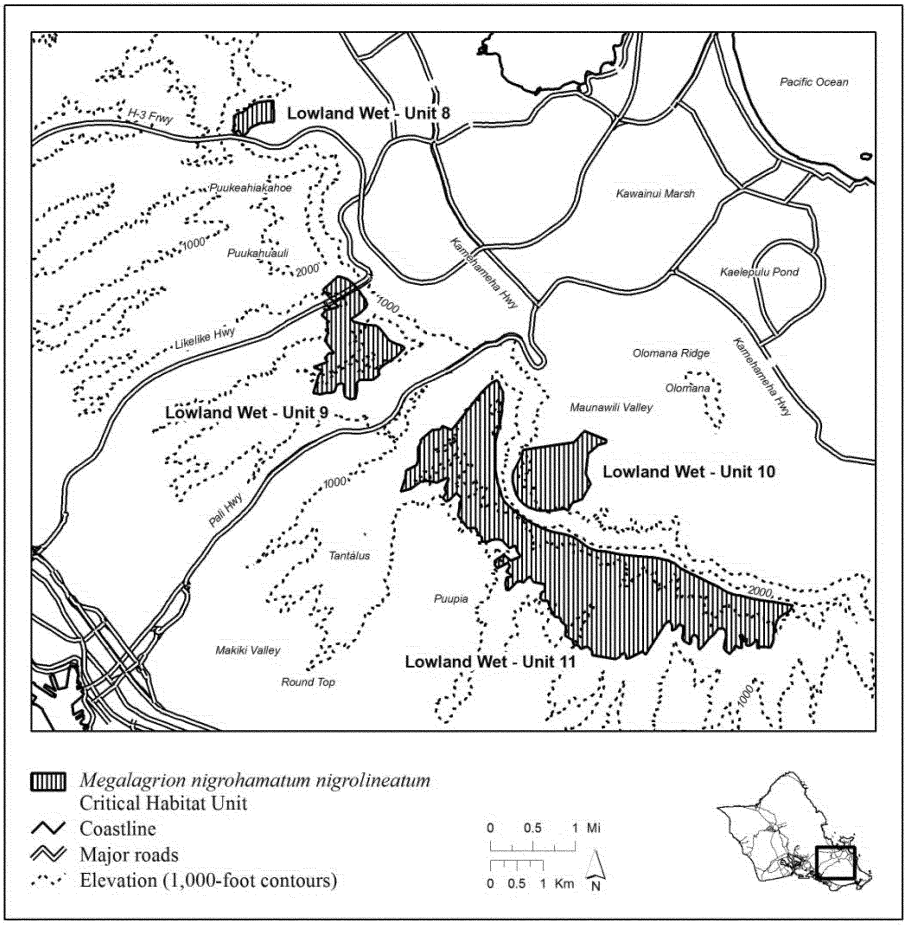
(8) *Megalagrion nigrohamatum nigrolineatum*—Unit 5—Lowland Wet, Honolulu County, Hawaii (124 ac; 50 ha); *Megalagrion nigrohamatum nigrolineatum*—Unit 6—Lowland Wet, Honolulu County, Hawaii (123 ac; 50 ha); and *Megalagrion nigrohamatum nigrolineatum*—Unit 7—Lowland Wet, Honolulu County, Hawaii (53 ac; 21 ha). These units are critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.* 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 (75 ac; 30 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). These units are critical habitat for the blackline Hawaiian damselfly, *Megalagrion nigrohamatum nigrolineatum.* 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



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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, existing trails, campgrounds and their immediate surrounding landscaped area, scenic lookouts, remote helicopter landing sites, and existing fences are not

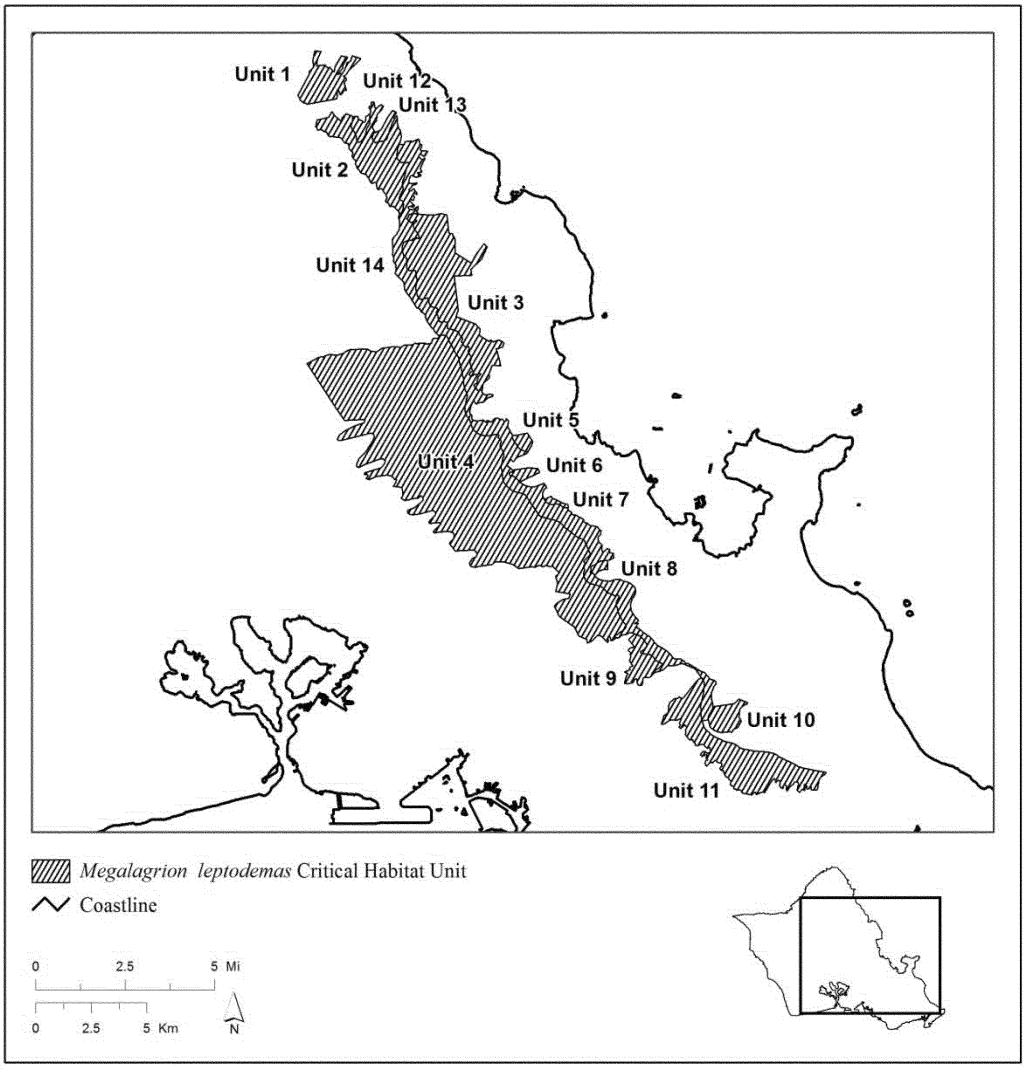
included in the critical habitat designation. Federal actions limited to those areas, therefore, would not trigger a consultation under section 7 of the Act unless they may affect the species or physical or biological features in adjacent critical habitat.

(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). The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site, *http://www.fws.gov/pacificislands*; at *http://www.regulations.gov* at Docket No. FWS–R1–ES–2010–0043; and at the field office responsible for the designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) Index map of critical habitat units for the crimson Hawaiian damselfly (*Megalagrion leptodemas*) follows:

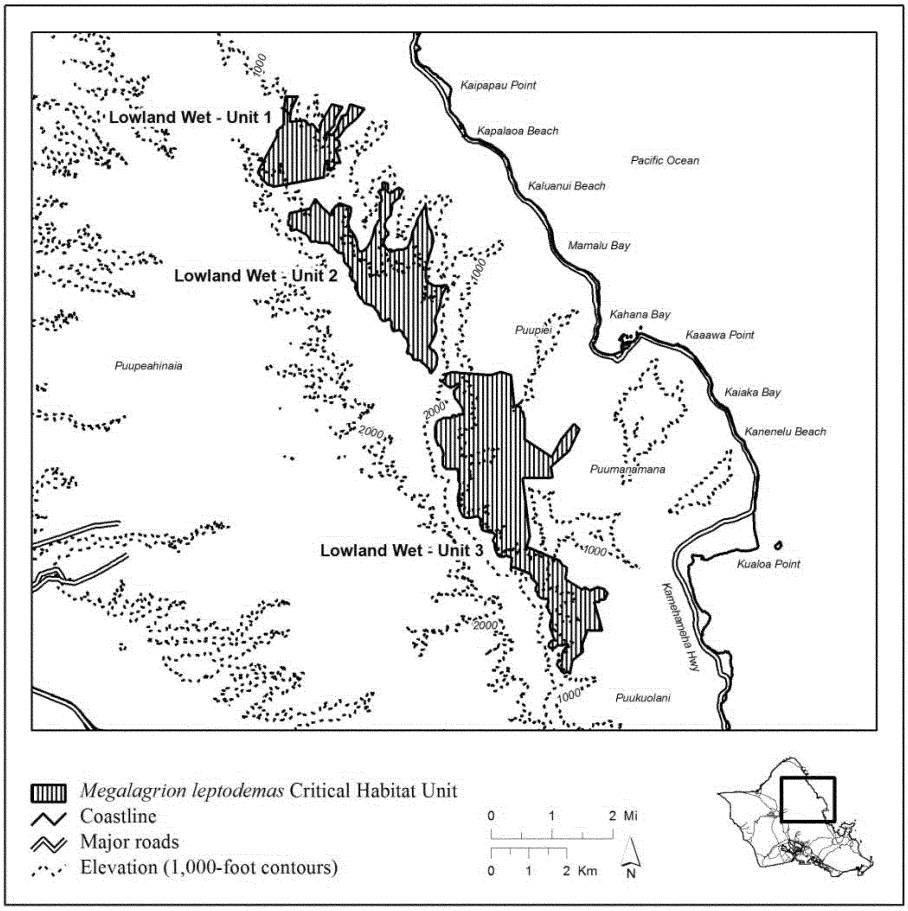
BILLING CODE 4310–55–P

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 (1,787ac; 723 ha); and *Megalagrion leptodemas*—Unit 3—Lowland Wet, Honolulu County, Hawaii (3,041 ac; 1,231 ha). These units are critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.* Map of *Megalagrion leptodemas*—Unit 1—Lowland Wet, *Megalagrion leptodemas*—Unit 2—Lowland Wet, and *Megalagrion leptodemas*—Unit 3—Lowland Wet follows:

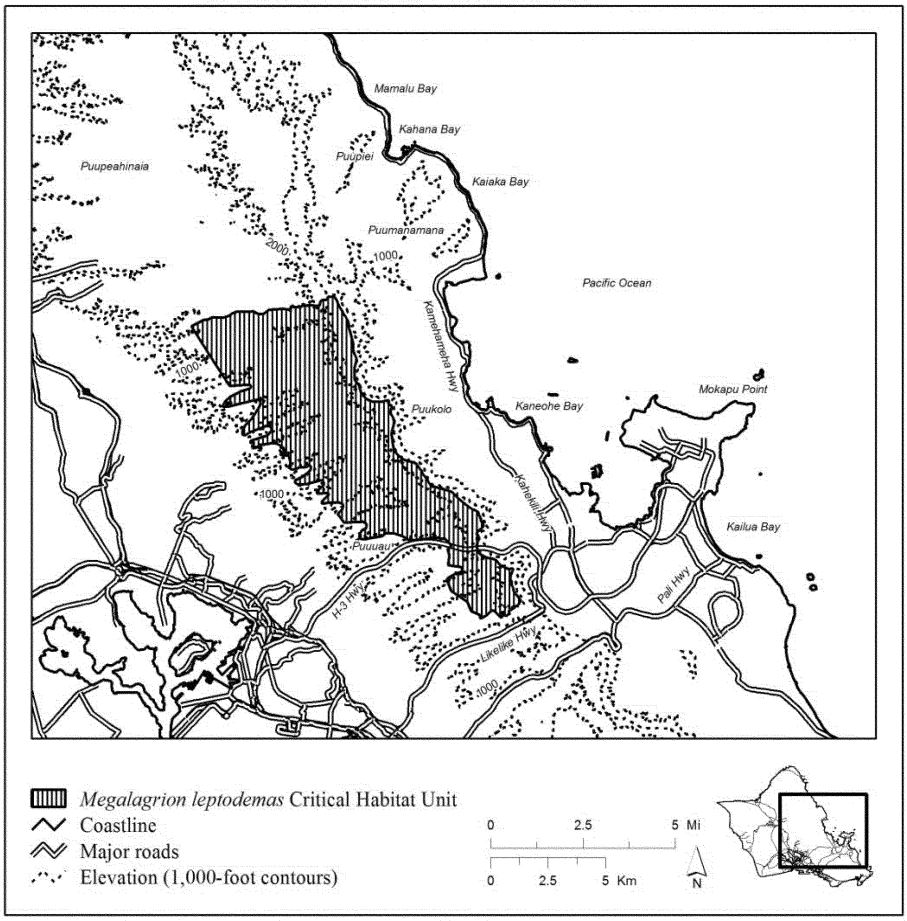
Megalagrion leptodemas
Lowland Wet
Unit 1, Unit 2 and Unit 3



(7) *Megalagrion leptodemas*—Unit 4—Lowland Wet, Honolulu County, Hawaii (15,728 ac; 6,365 ha). This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

Map of *Megalagrion leptodemas*—Unit 4—Lowland Wet follows:

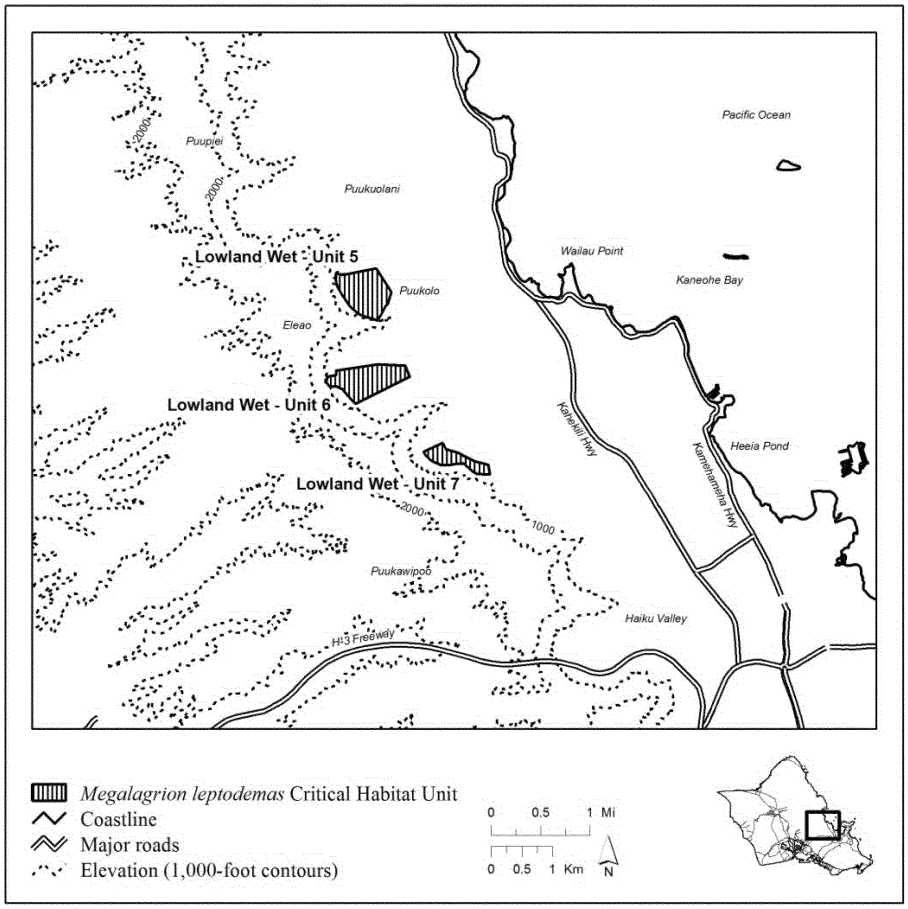
Megalagrion leptodemas
Lowland Wet
Unit 4



(8) *Megalagrion leptodemas*—Unit 5—Lowland Wet, Honolulu County, Hawaii (124 ac; 50 ha); *Megalagrion leptodemas*—Unit 6—Lowland Wet, Honolulu County, Hawaii (123 ac; 50 ha); and *Megalagrion leptodemas*—Unit 7—Lowland Wet, Honolulu County, Hawaii (53 ac; 21 ha). These units are critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

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

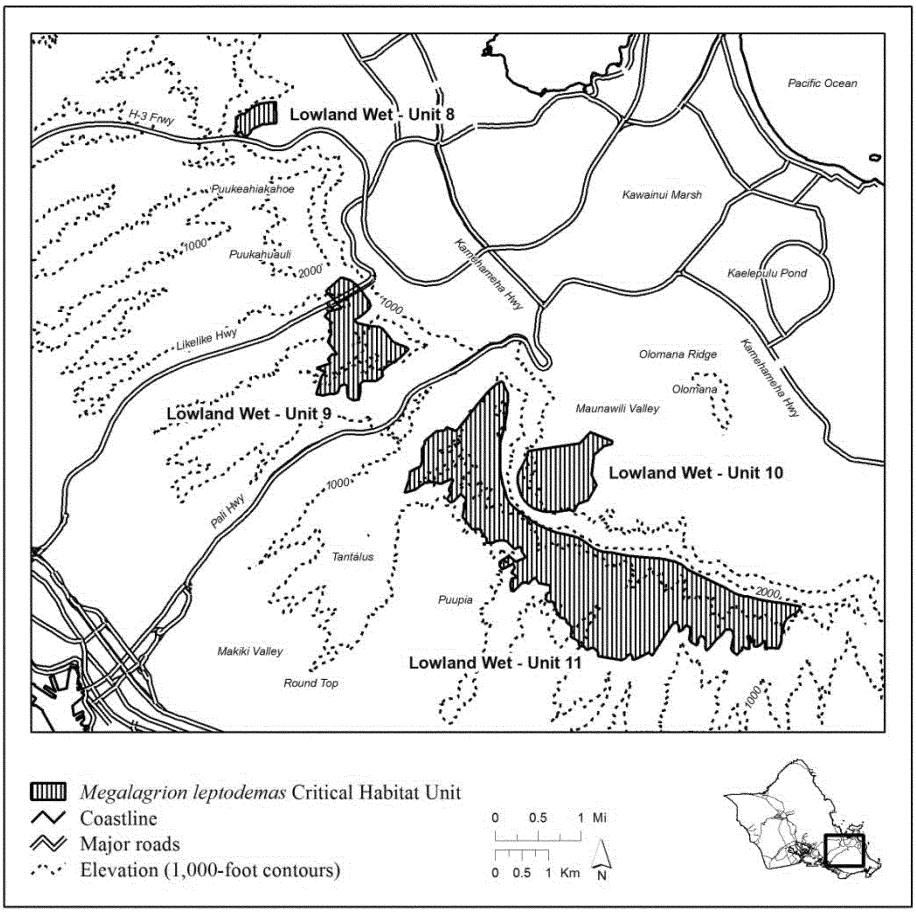
Megalagrion leptodemas
Lowland Wet
Unit 5, Unit 6 and Unit 7



(9) *Megalagrion leptodemas*—Unit 8—Lowland Wet, Honolulu County, Hawaii (75 ac; 30 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). These units are critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.*

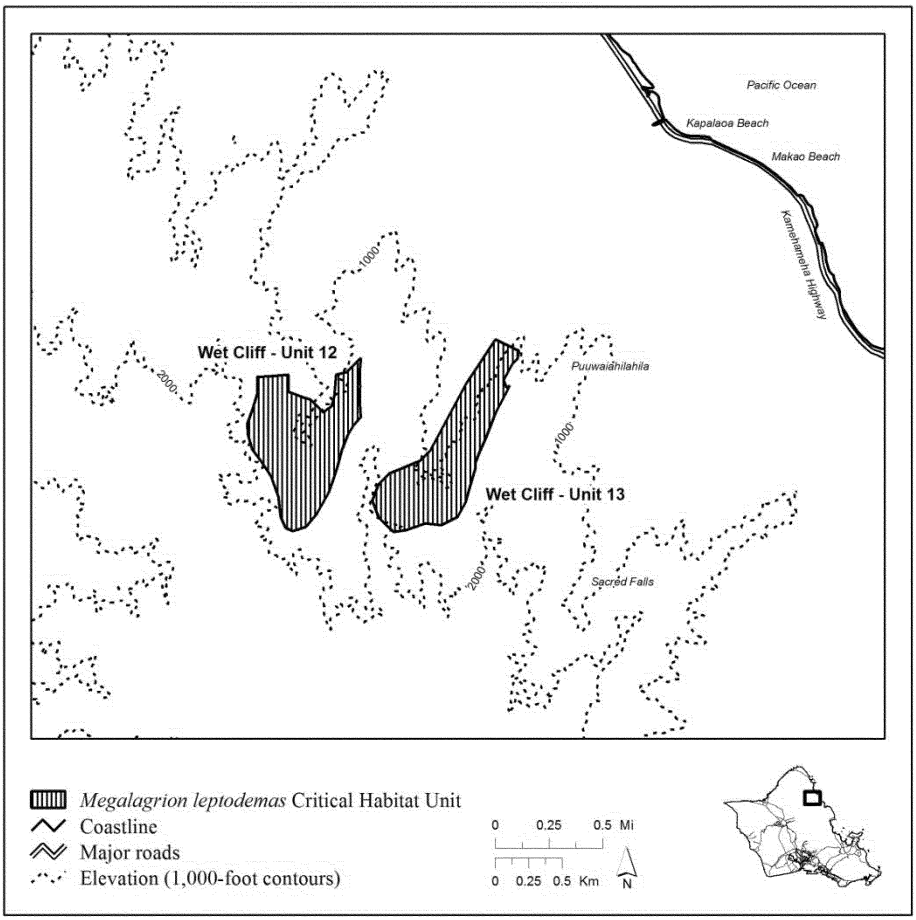
Map of *Megalagrion leptodemas*—Unit 8—Lowland Wet, *Megalagrion leptodemas*—Unit 9—Lowland Wet, *Megalagrion leptodemas*—Unit 10—Lowland Wet, and *Megalagrion leptodemas*—Unit 11—Lowland Wet follows:

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



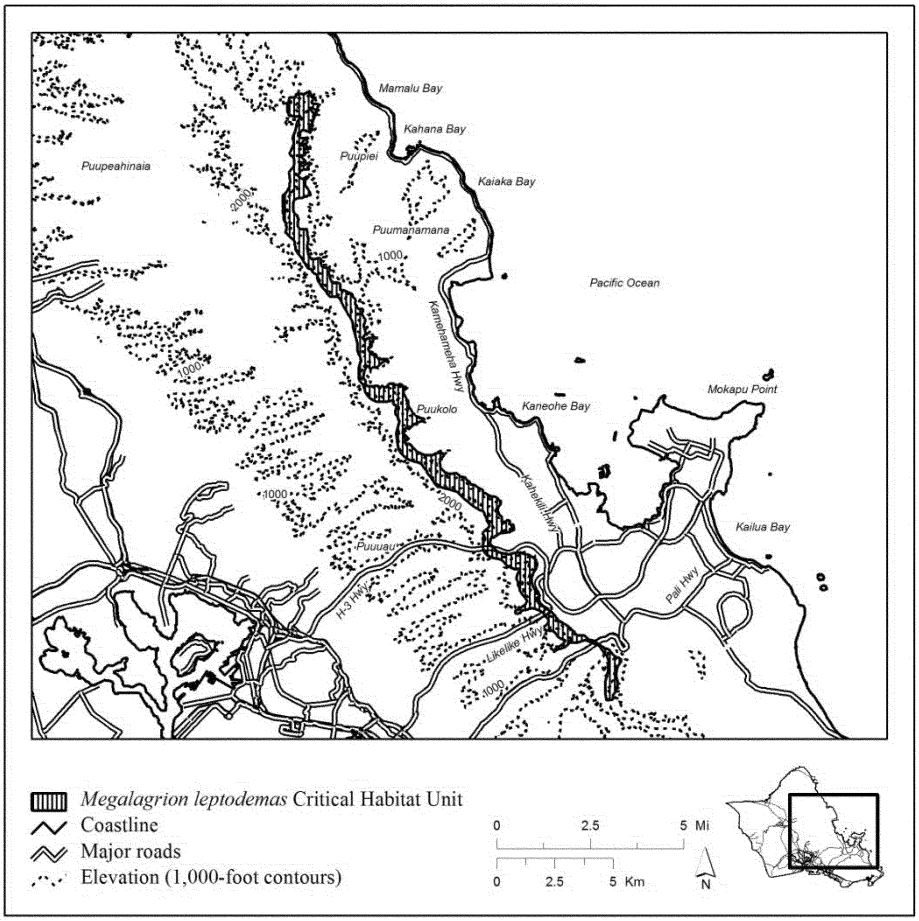
(10) *Megalagrion leptodemas*—Unit 12—Wet Cliff, Honolulu County, Hawaii (151 ac; 61 ha) and *Megalagrion leptodemas*—Unit 13—Wet Cliff, Honolulu County, Hawaii (144 ac; 58 ha). These units are critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.* Map of *Megalagrion leptodemas*—Unit 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). This unit is critical habitat for the crimson Hawaiian damselfly, *Megalagrion leptodemas.* Map of *Megalagrion leptodemas*—Unit 14—Wet Cliff follows:

Megalagrion leptodemas
Wet Cliff
Unit 14



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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.

(H) 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, existing trails, campgrounds and their immediate surrounding landscaped area, scenic lookouts, remote helicopter landing sites, and existing fences are not included in the critical habitat designation. 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

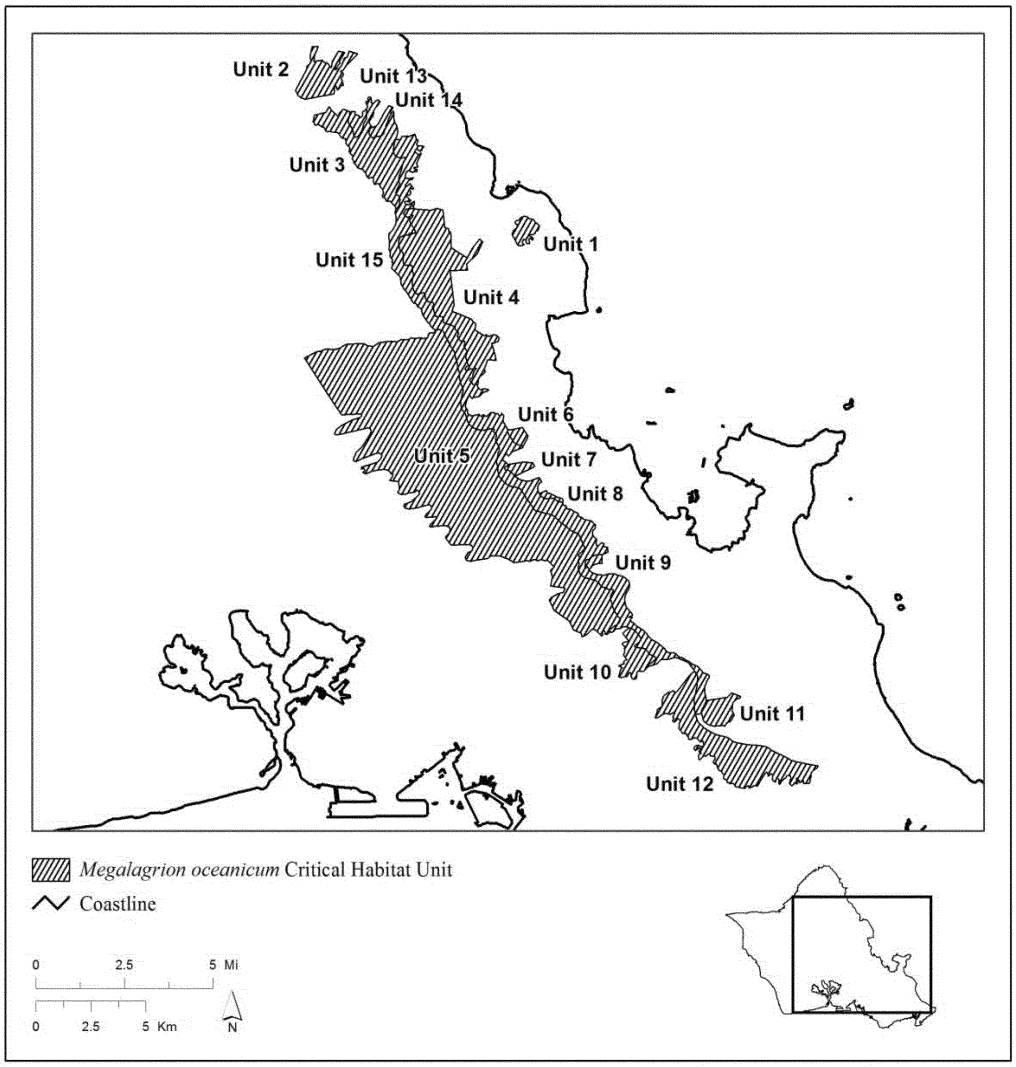
physical and biological features in adjacent critical habitat.

(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). The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site, *http://www.fws.gov/pacificislands*; at *http://www.regulations.gov* at Docket No. FWS–R1–ES–2010–0043; and at the field office responsible for the designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) Index map of critical habitat units for the oceanic Hawaiian damselfly (*Megalagrion oceanicum*) follows:

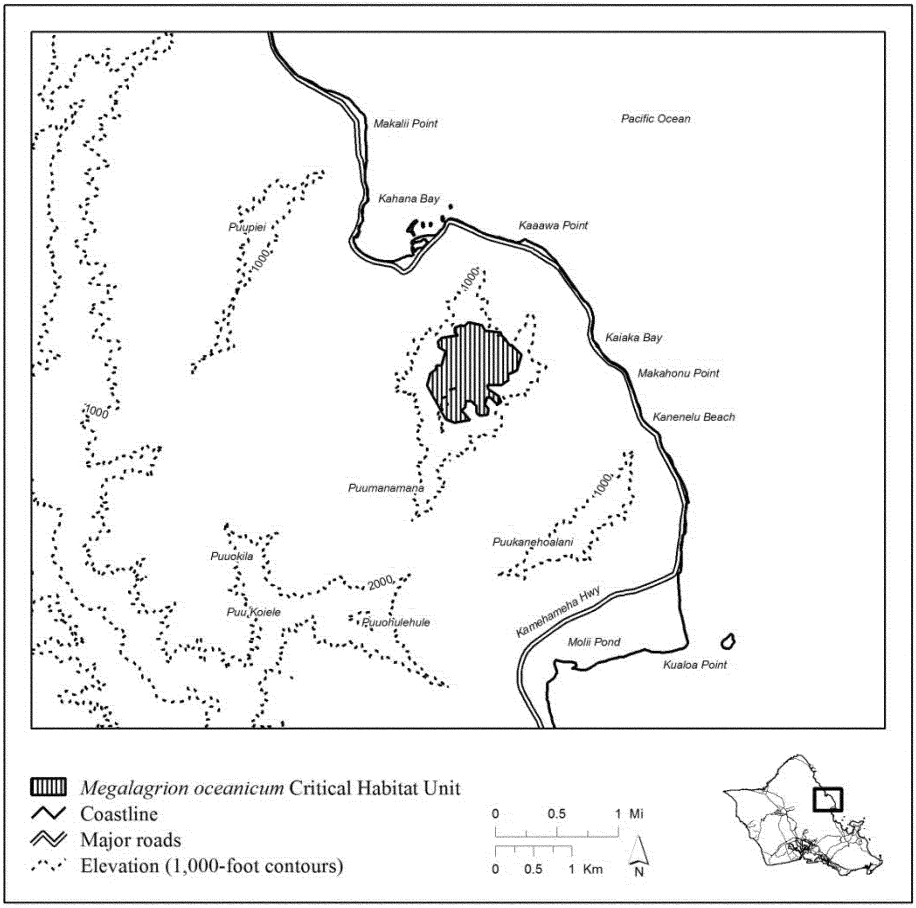
BILLING CODE 4310–55–P

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



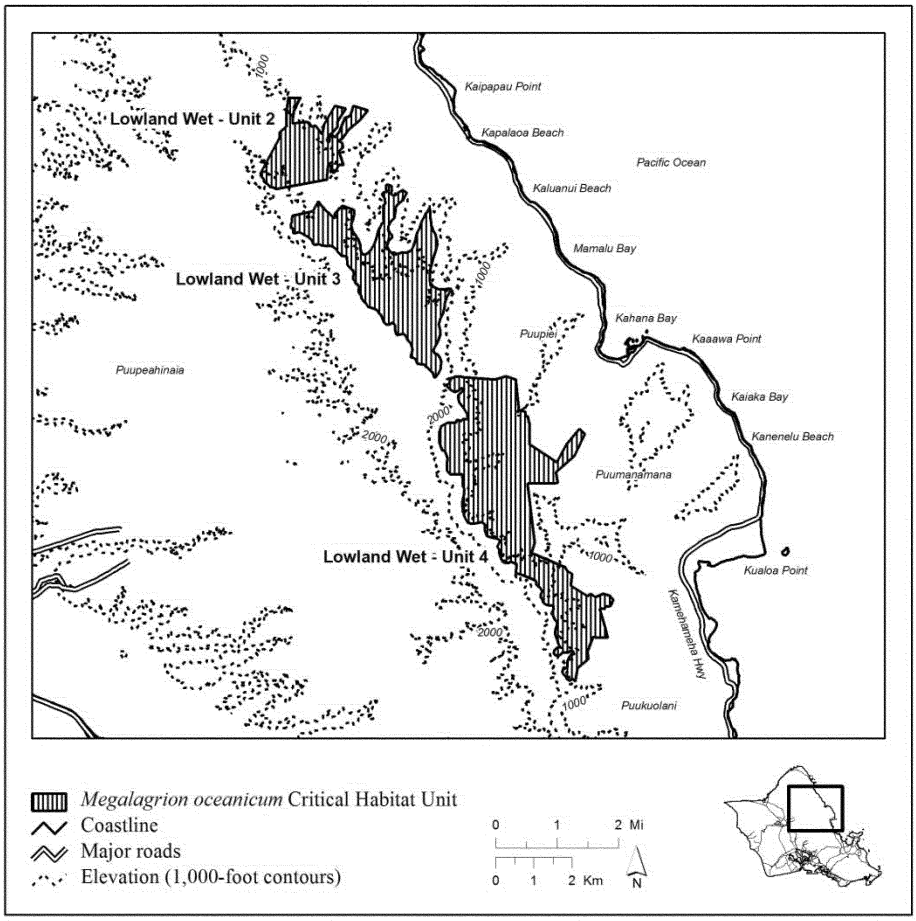
(6) *Megalagrion oceanicum*—Unit 1—Lowland Mesic, Honolulu County, Hawaii (247 ac; 100 ha). This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum*. Map of *Megalagrion oceanicum*—Unit 1—Lowland Mesic (Map 2) follows:

Megalagrion oceanicum
Lowland Mesic
Unit 1



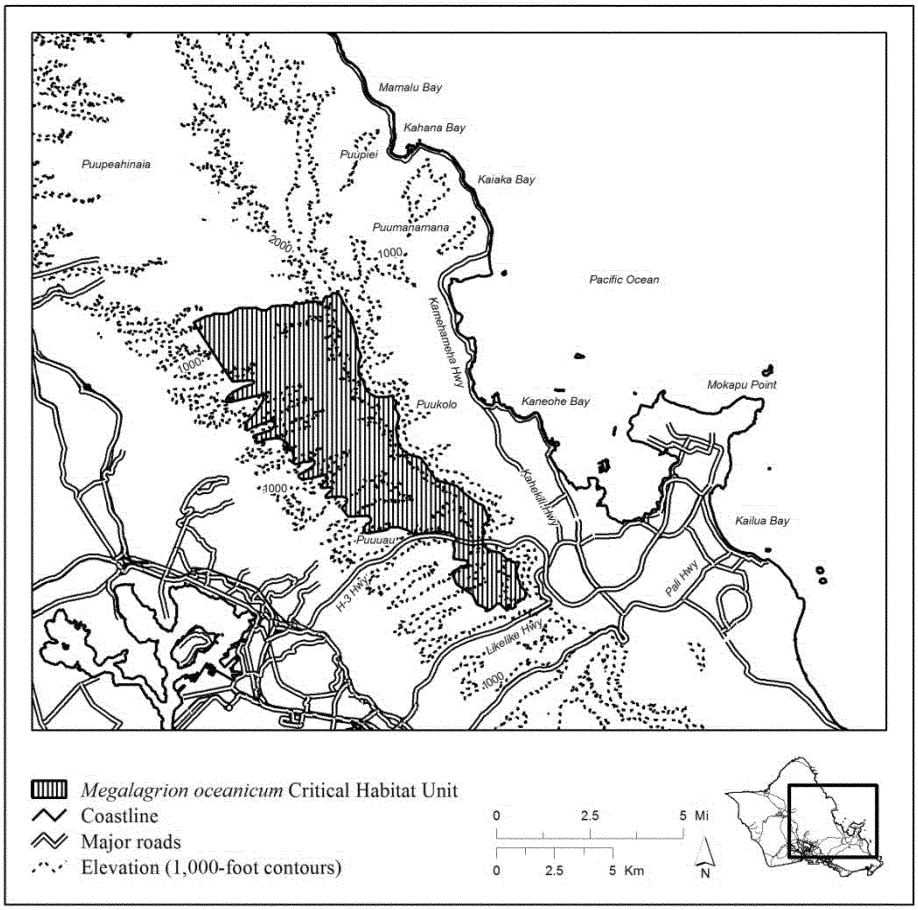
(7) *Megalagrion oceanicum*—Unit 2—Lowland Wet, Honolulu County, Hawaii (790 ac; 320 ha); *Megalagrion oceanicum*—Unit 3—Lowland Wet, Honolulu County, Hawaii (1,787 ac; 723 ha); and *Megalagrion oceanicum*—Unit 4—Lowland Wet, Honolulu County, Hawaii (3,041 ac; 1,231 ha). These units are critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.* 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



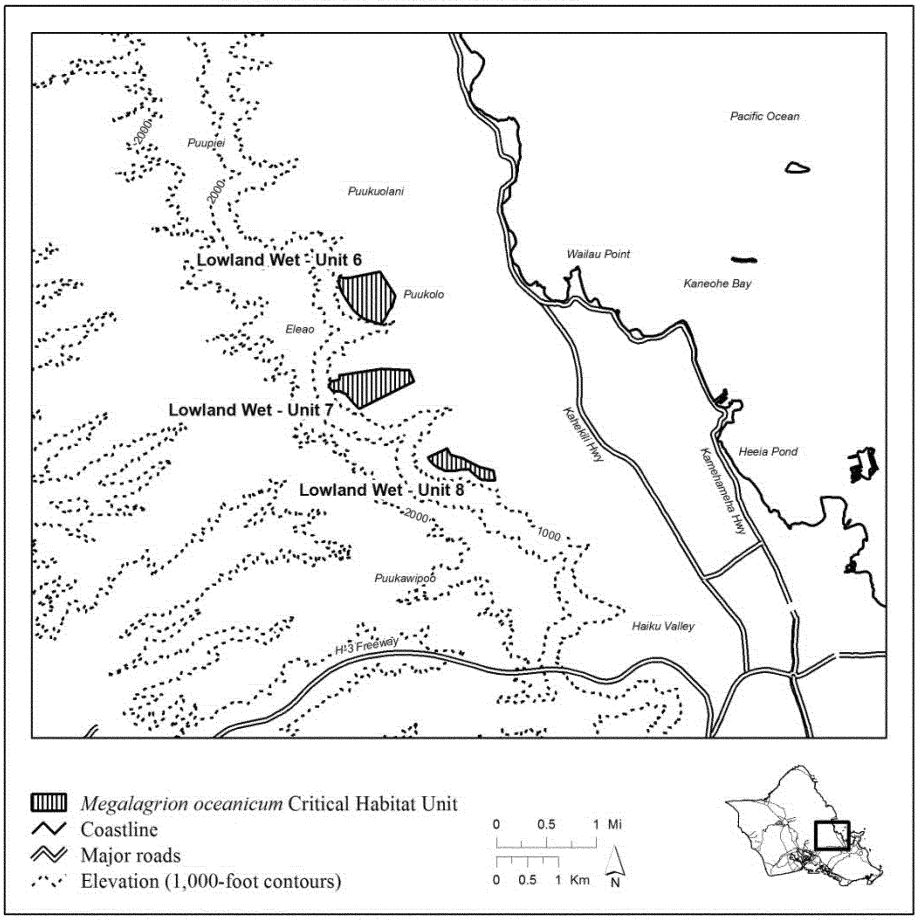
(8) *Megalagrion oceanicum*—Unit 5—Lowland Wet, Honolulu County, Hawaii (15,728 ac; 6,365 ha). This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum*. Map of *Megalagrion oceanicum*—Unit 5—Lowland Wet follows:

Megalagrion oceanicum
Lowland Wet
Unit 5



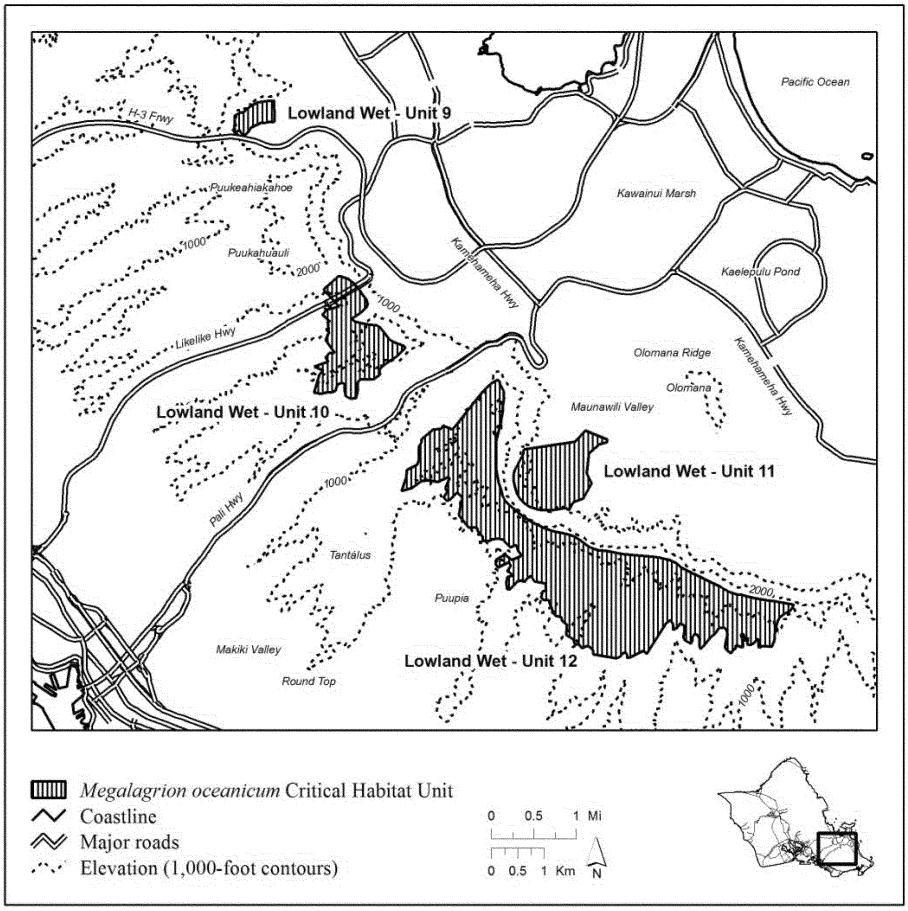
(9) *Megalagrion oceanicum*—Unit 6—Lowland Wet, Honolulu County, Hawaii (124 ac; 50 ha); *Megalagrion oceanicum*—Unit 7—Lowland Wet, Honolulu County, Hawaii (123 ac; 50 ha); and *Megalagrion oceanicum*—Unit 8—Lowland Wet, Honolulu County, Hawaii (53 ac; 21 ha). These units are critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum*. 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



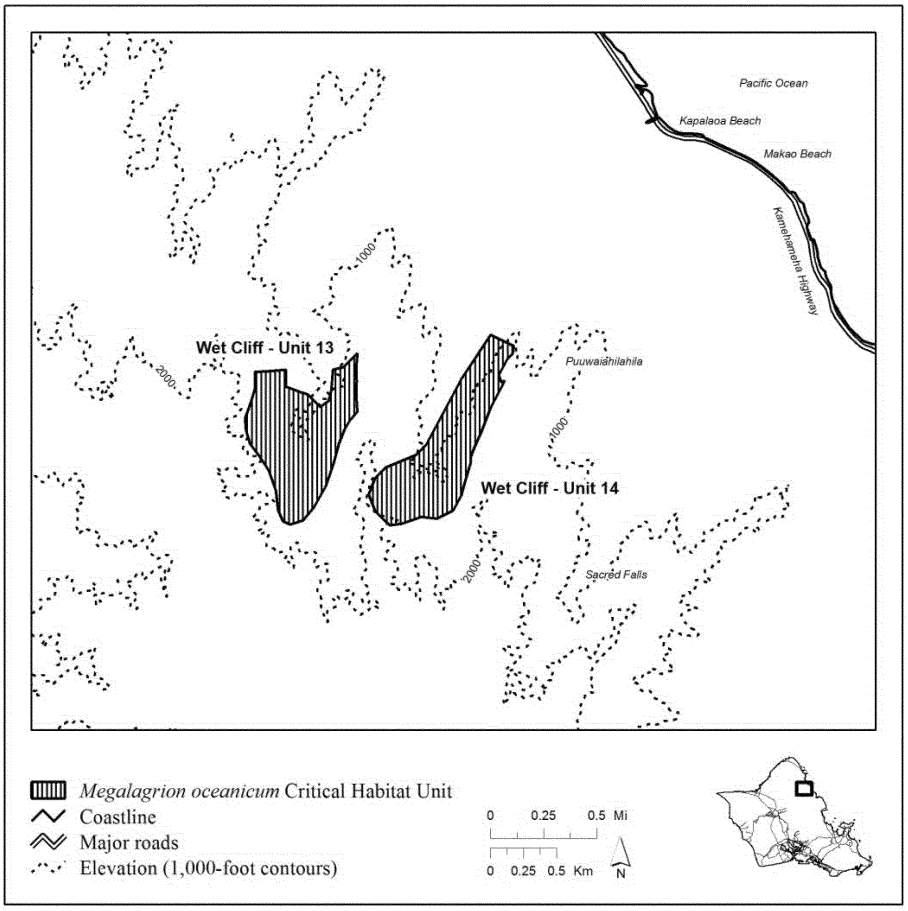
(10) *Megalagrion oceanicum*—Unit 9—Lowland Wet, Honolulu County, Hawaii (75 ac; 30 ha); *Megalagrion oceanicum*—Unit 10—Lowland Wet, Honolulu County, Hawaii (478 ac; 193 ha); *Megalagrion oceanicum*—Unit 11—Lowland Wet, Honolulu County, Hawaii (407 ac; 165 ha); and *Megalagrion oceanicum*—Unit 12—Lowland Wet, Honolulu County, Hawaii (2,507 ac; 1,014 ha). These units are critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum*. 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



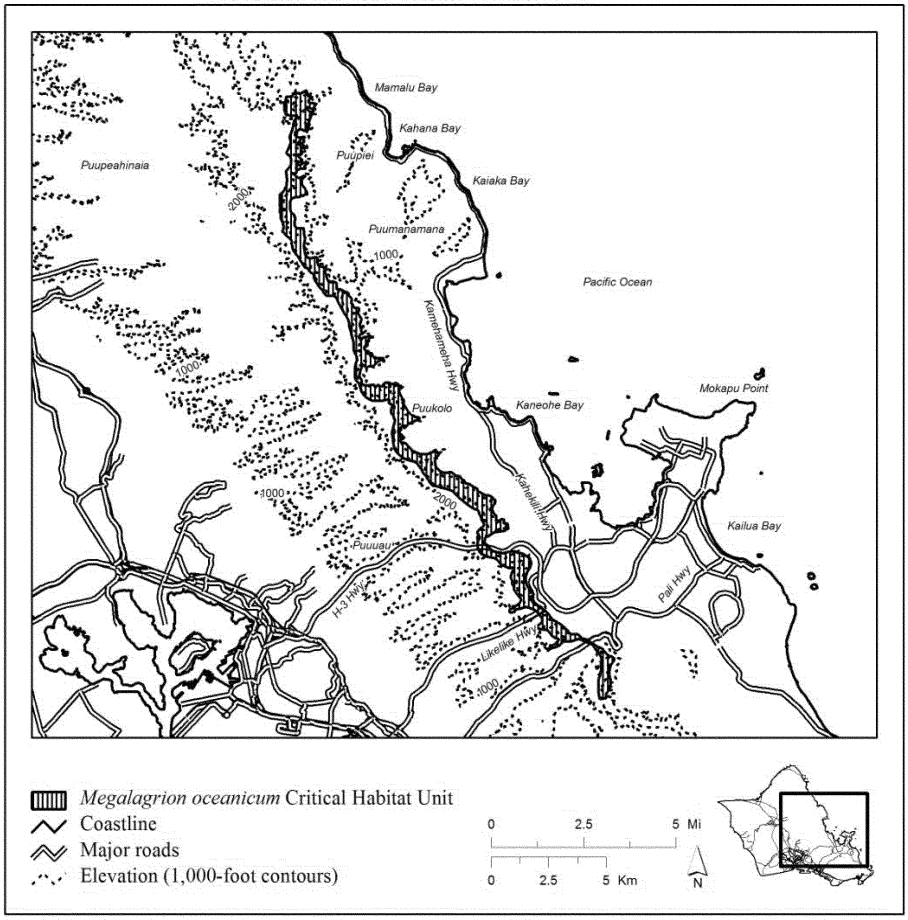
(11) *Megalagrion oceanicum*—Unit 13—Wet Cliff, Honolulu County, Hawaii (151 ac; 61 ha) and *Megalagrion oceanicum*—Unit 14—Wet Cliff, Honolulu County, Hawaii (144 ac; 58 ha). These units are critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.* Map of *Megalagrion oceanicum*—Unit 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). This unit is critical habitat for the oceanic Hawaiian damselfly, *Megalagrion oceanicum.* 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.

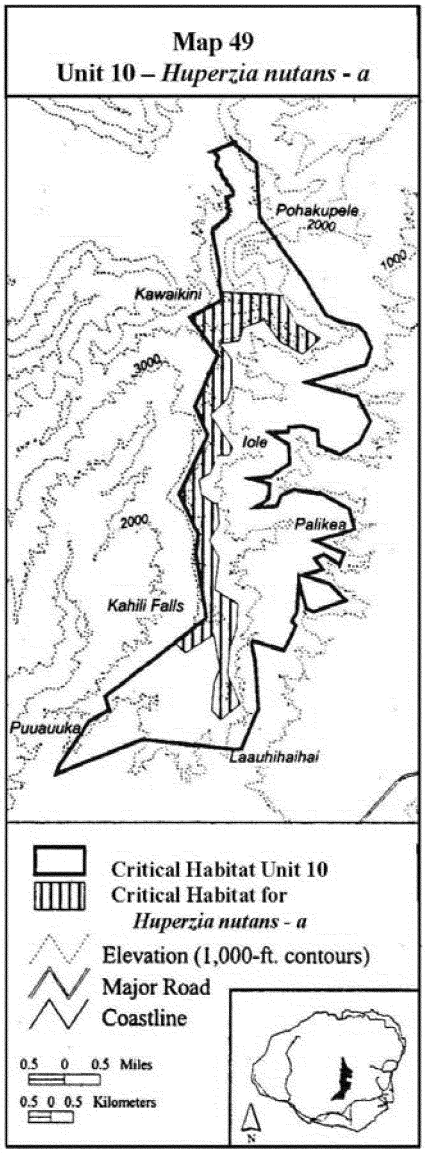
(a) * * *

(1) * * *

(civ) * * *

(B) *Note:* Map 49 follows:

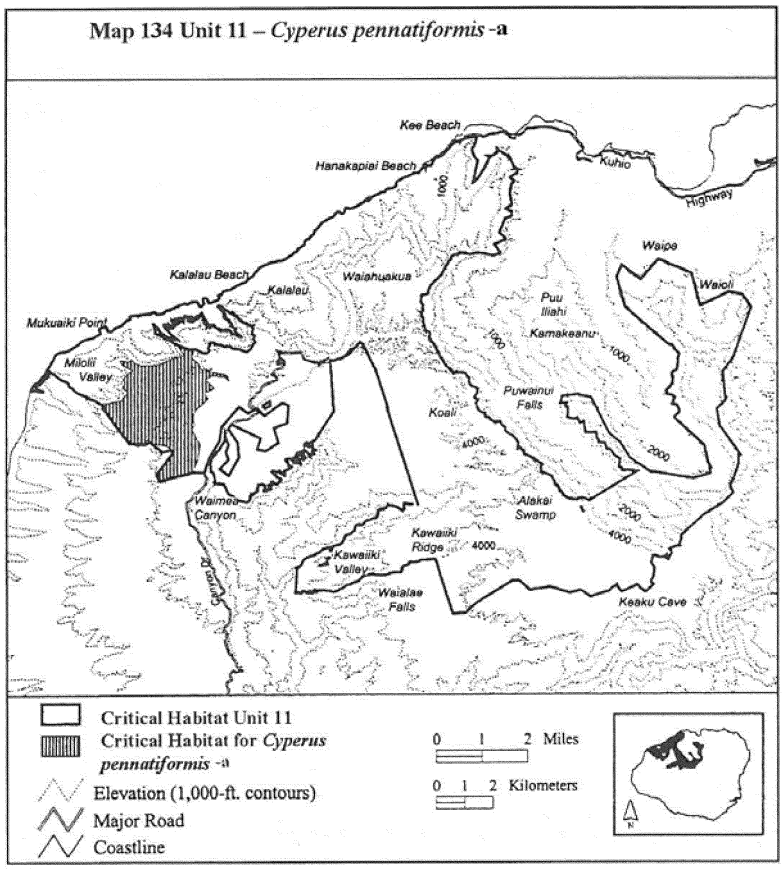
BILLING CODE 4310–55–P



(ccxl) * * *

* * * * *

(B) *Note:* Map 134 follows:



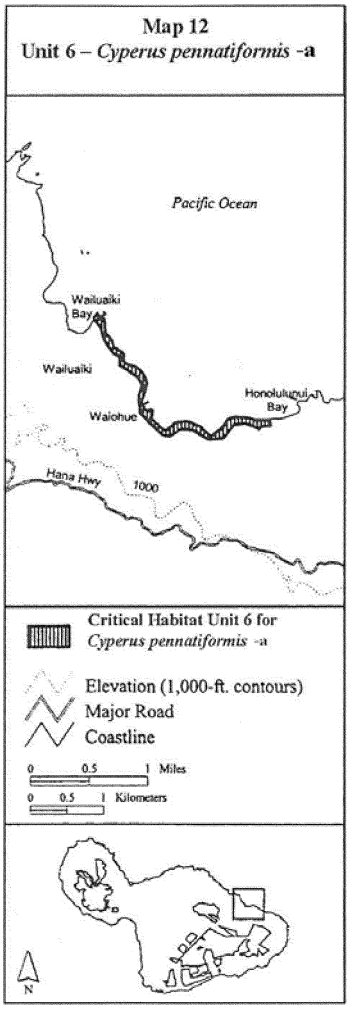
* * * * *

(e) * * *

(1) * * *

(xii) * * *

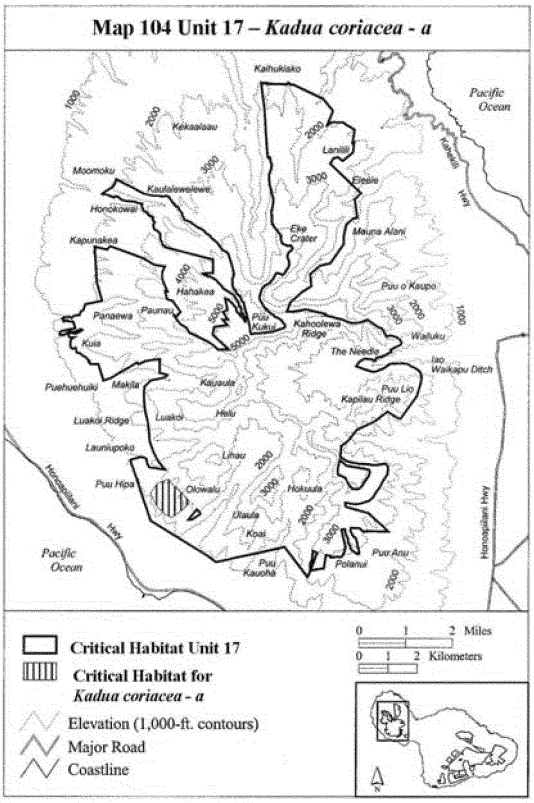
(B) *Note:* Map 12 follows:



* * * * *

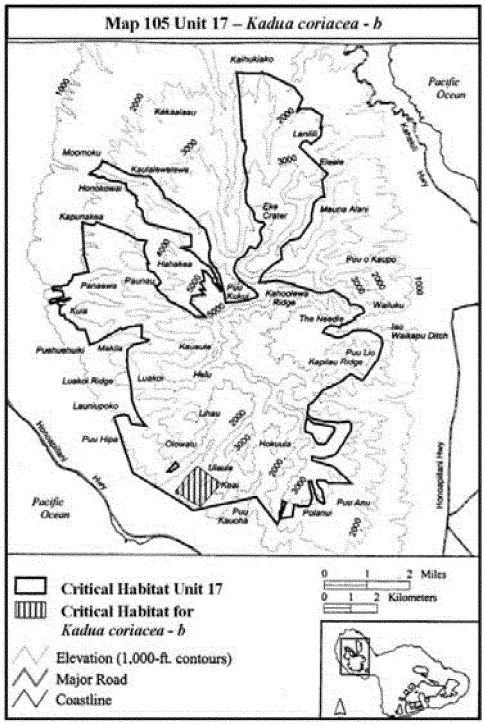
(civ) * * *

(B) *Note:* Map 104 follows:



(cv) * * *

(B) *Note:* Map 105 follows:

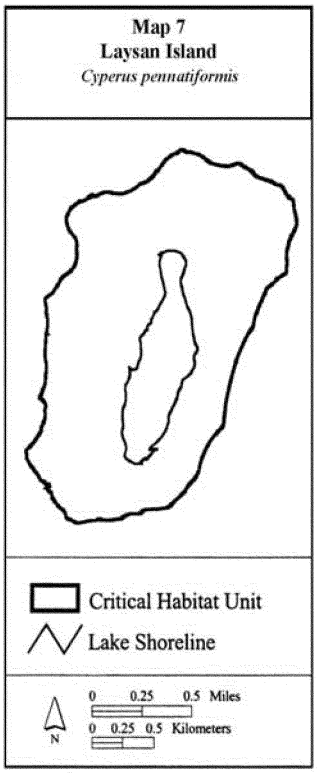


* * * * *

(g) * * *

(7) * * *

(ii) *Note:* Map 7 follows:

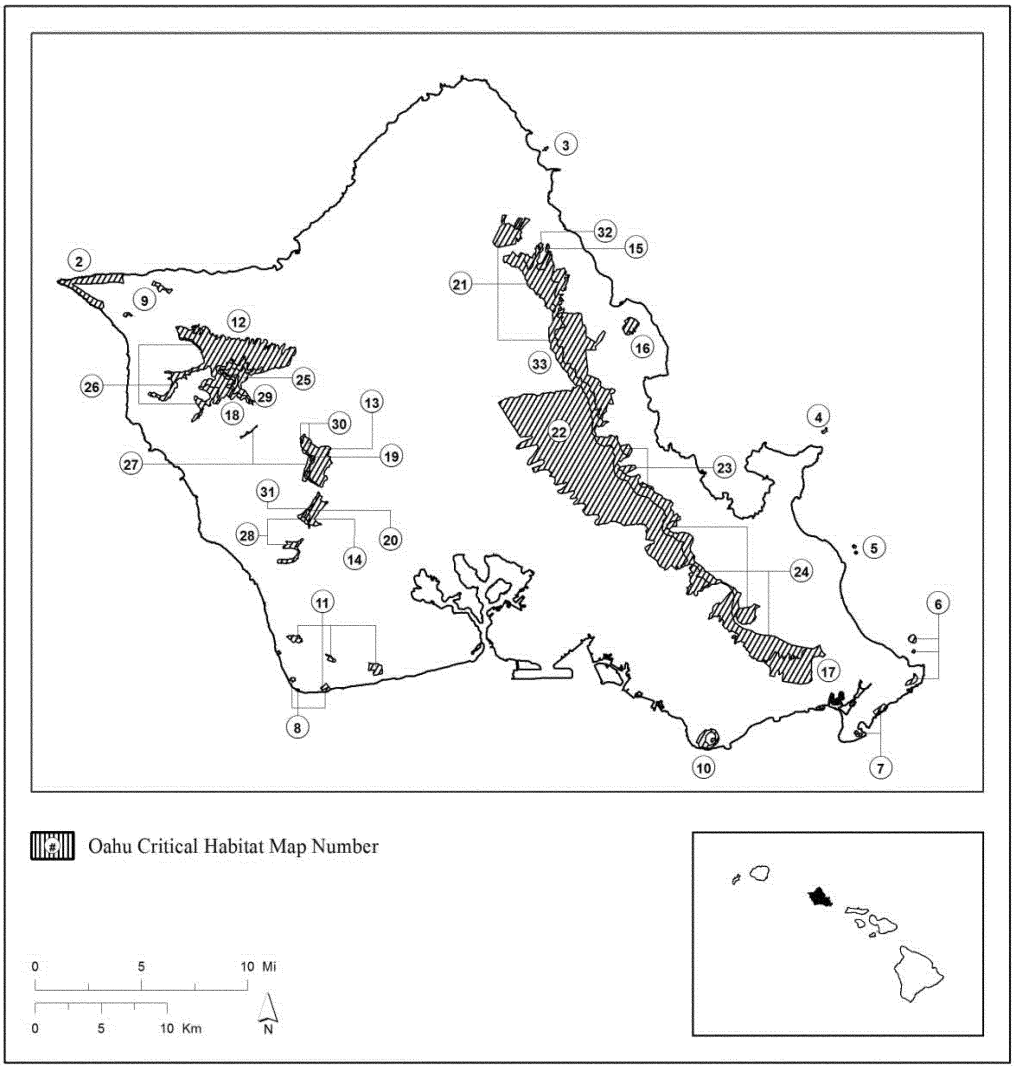


* * * * *

(i) *Oahu.* Critical habitat units are described below. Maps were created in GIS, with coordinates in UTM Zone 4 with units in meters using North American Datum of 1983 (NAD83). The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at the Service's Internet site, *http://www.fws.gov/pacificislands*; at *http://www.regulations.gov* at Docket No. FWS–R1–ES–2010–0043; and at the field office responsible for the designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2. Existing manmade features and structures, such as buildings, roads, railroads, airports, runways, other paved areas, lawns, and other urban landscaped areas, existing trails, campgrounds and their immediate surrounding landscaped area, scenic lookouts, remote helicopter landing sites, and existing fences are not included in the critical habiat designation. 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) Map 1—Index map follows:

Map 1
Oahu Critical Habitat–Island Index Map

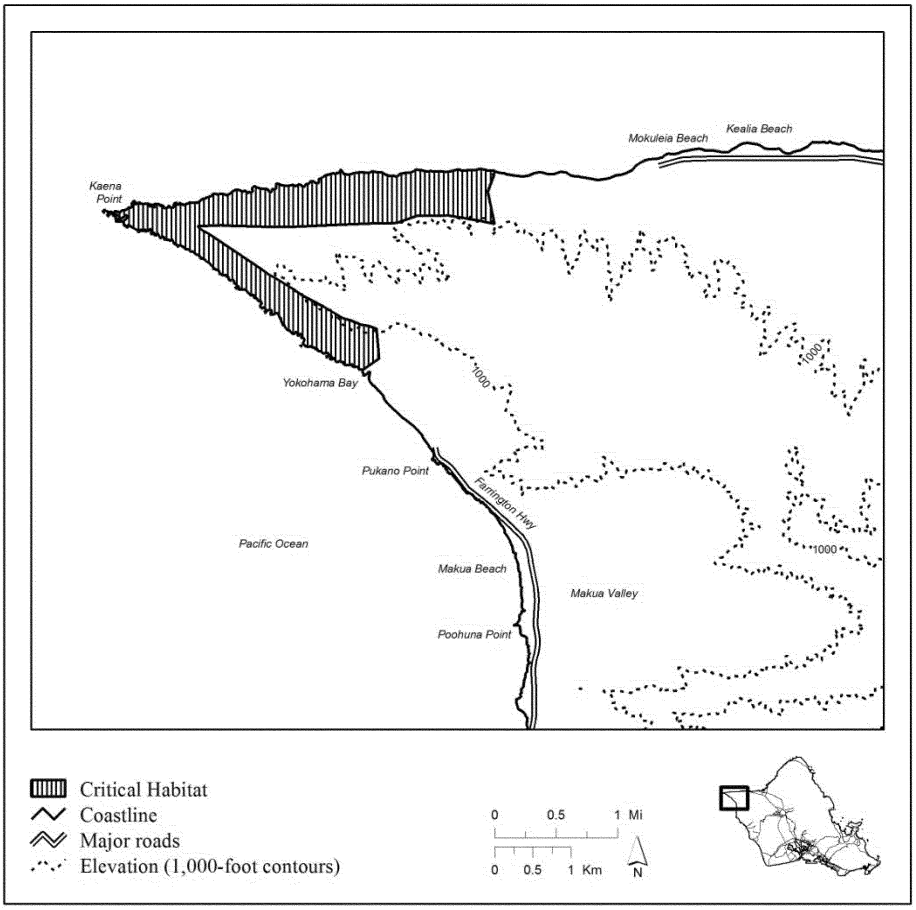


(2) Oahu—Coastal—Unit 1 (958 ac; 388 ha).

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

Map 2
Oahu–Coastal
Unit 1

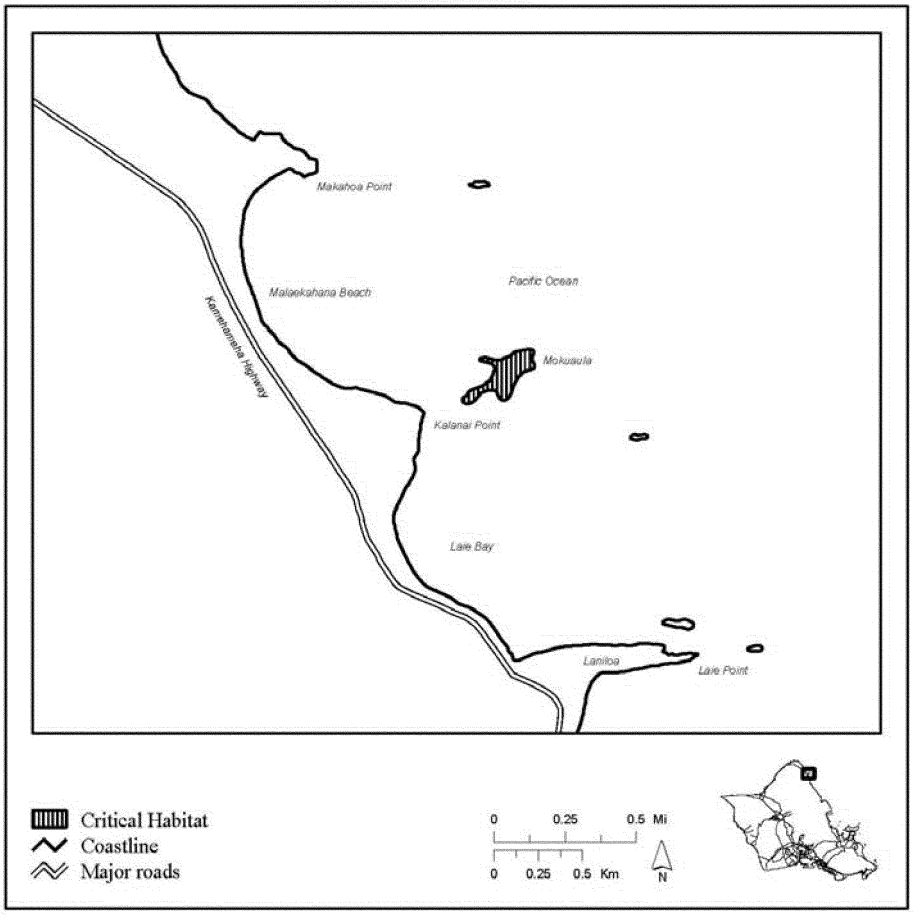


(3) Oahu—Coastal—Unit 2 (12 ac; 5 ha).

(i) This unit is critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

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

Map 3
Oahu–Coastal
Unit 2

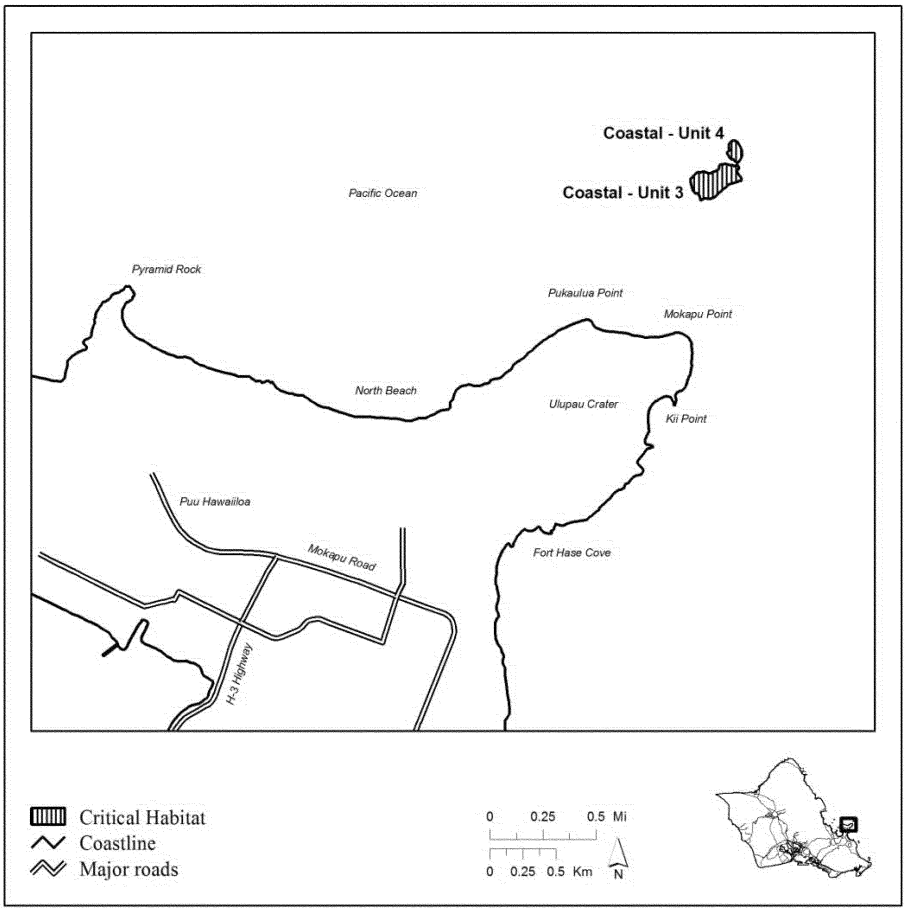


(4) Oahu—Coastal—Unit 3 (15 ac; 6 ha) and Oahu–Coastal–Unit 4 (3 ac; 1 ha).

(i) These units are critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(ii) Map of Oahu—Coastal—Unit 3 and Oahu—Coastal—Unit 4 (Map 4) follows:

Map 4
Oahu–Coastal Ecosystem
Unit 3 and Unit 4

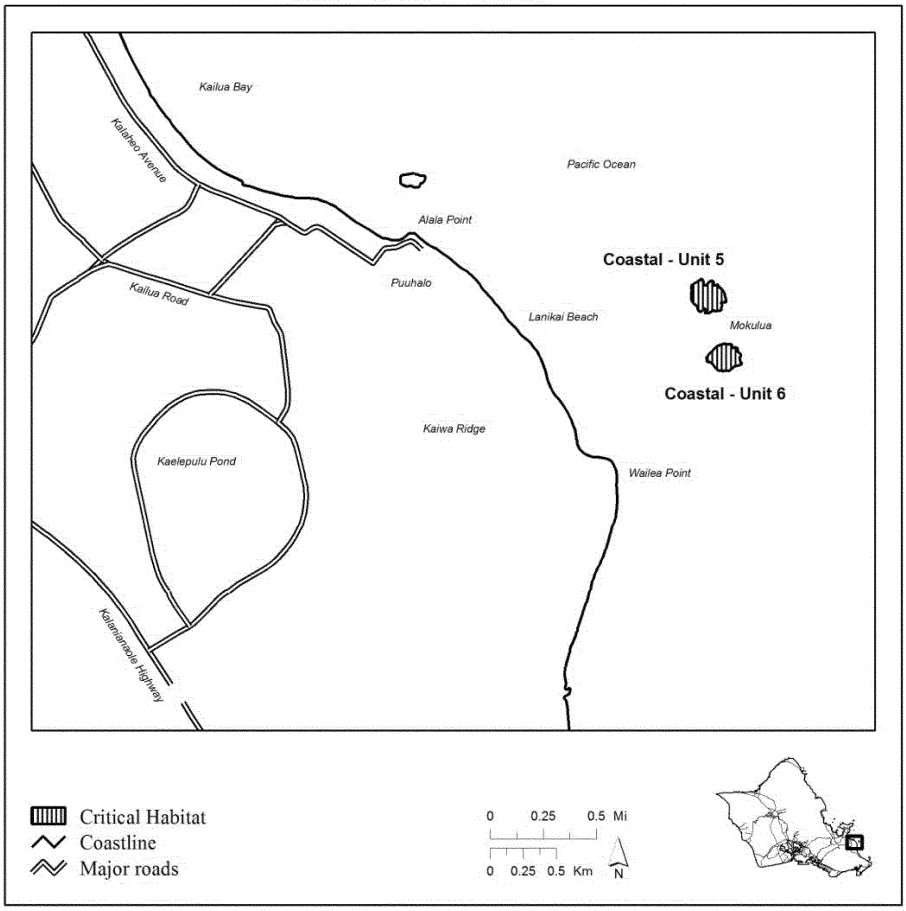


(5) Oahu—Coastal—Unit 5 (12 ac; 5 ha) and Oahu—Coastal—Unit 6 (9 ac; 4 ha).

(i) These units are critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(ii) Map of Oahu—Coastal—Unit 5 and Oahu—Coastal—Unit 6 (Map 5) follows:

Map 5
Oahu–Coastal
Unit 5 and Unit 6

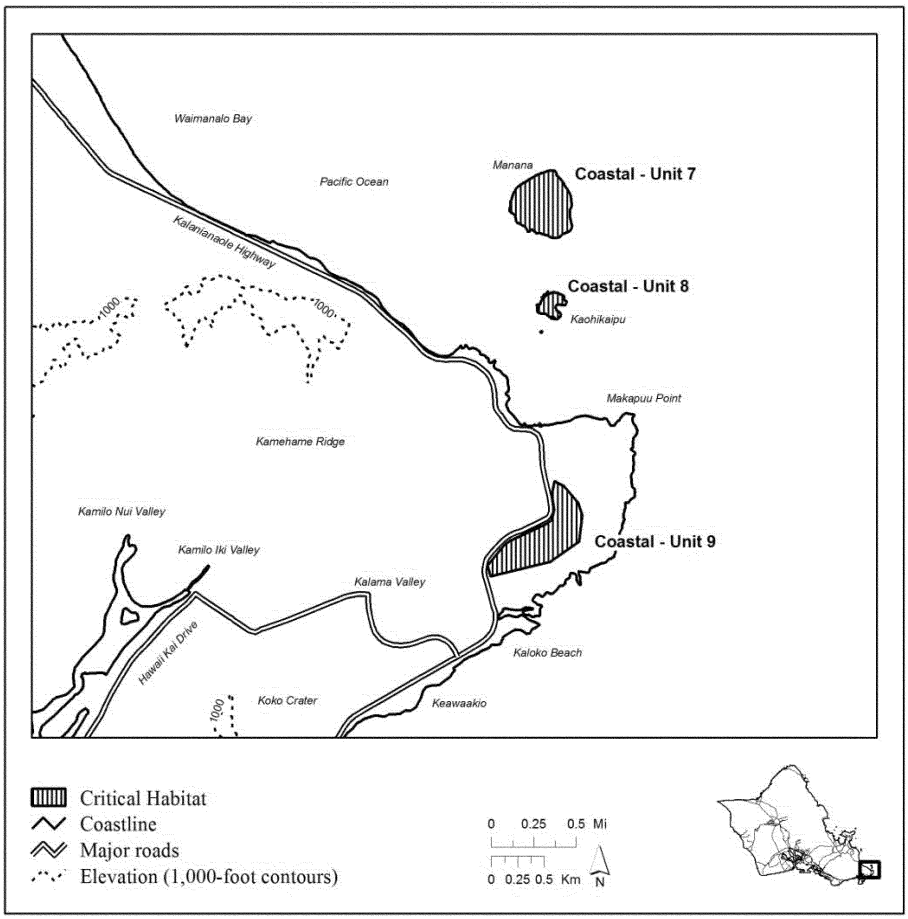


(6) Oahu—Coastal—Unit 7 (67 ac; 27 ha), Oahu—Coastal—Unit 8 (10 ac; 4 ha), and Oahu—Coastal—Unit 9 (80 ac; 33 ha).

(i) These units are critical habitat for, *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(ii) 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



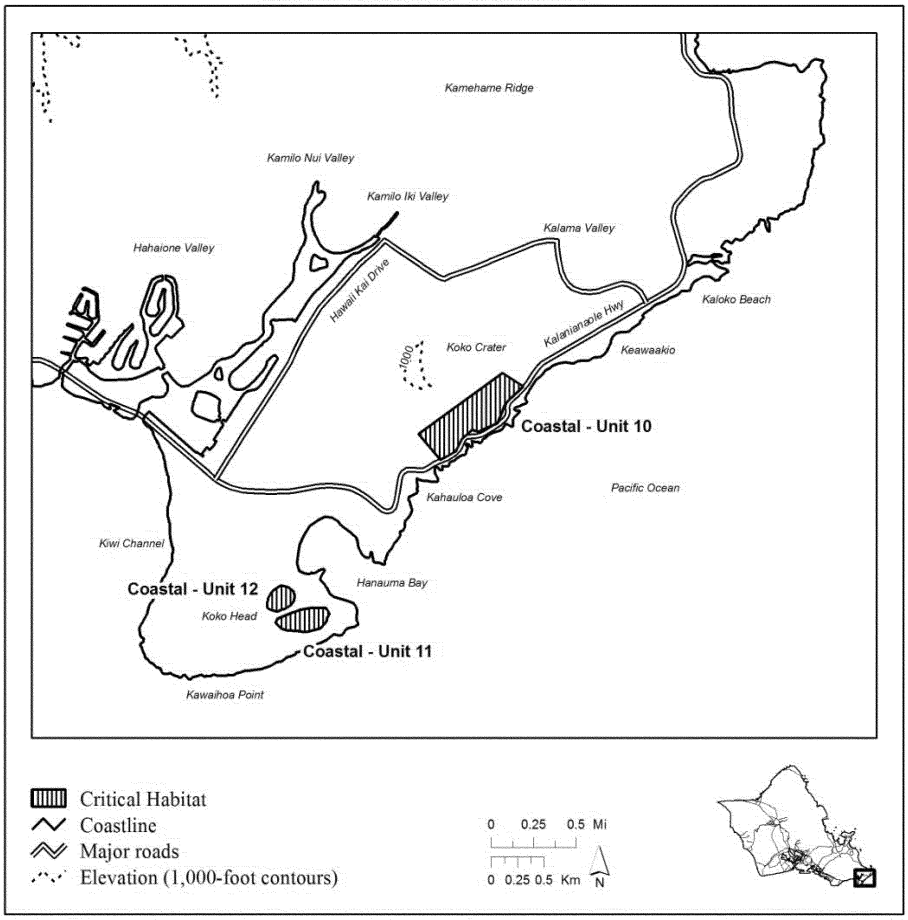
(7) Oahu—Coastal—Unit 10 (74 ac; 30 ha), Oahu—Coastal—Unit 11 (20 ac; 8 ha), and Oahu—Coastal—Unit 12 (11 ac; 5 ha).

(i) Oahu—Coastal—Unit 10 is critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(ii) Oahu—Coastal—Unit 11 and Oahu—Coastal—Unit 12 are critical habitat for *Centaurium sebaeoides, Chamaesyce kuwaleana, Cyperus trachysanthos, Marsilea villosa, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(iii) 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

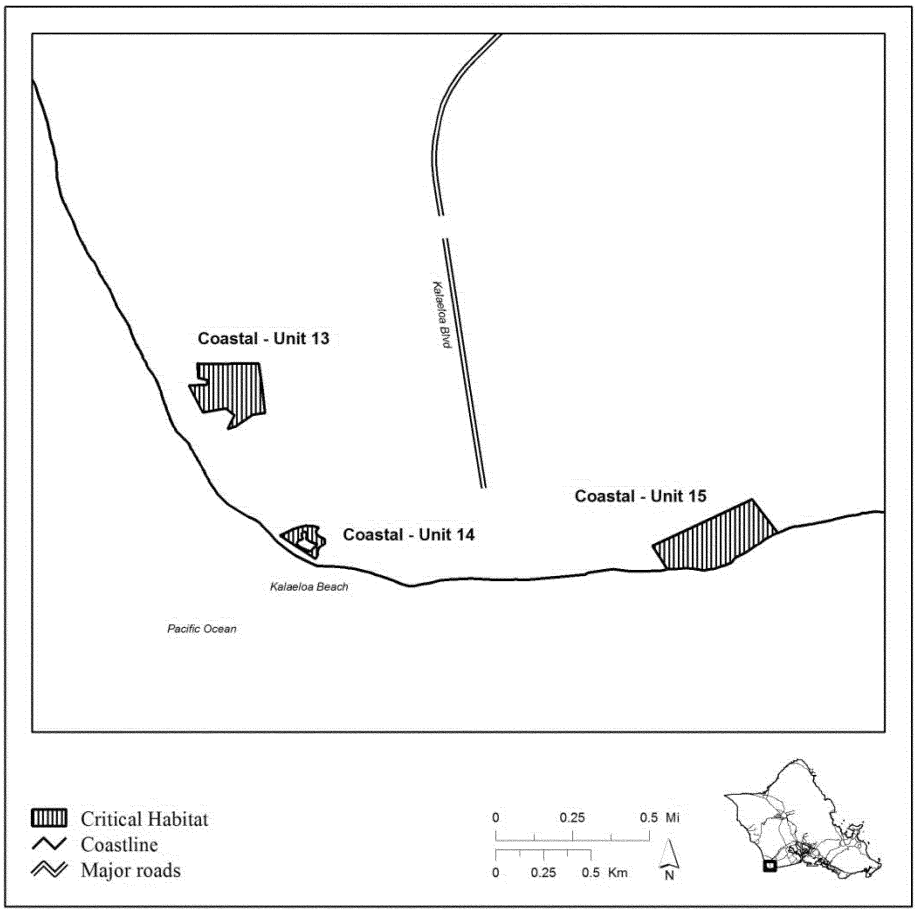


(8) Oahu—Coastal—Unit 13 (23 ac; 10 ha), Oahu—Coastal—Unit 14 (4 ac; 2 ha), and Oahu—Coastal—Unit 15 (33 ac; 13 ha).

(i) These units are critical habitat for *Achyranthes splendens* var. *rotundata, Bidens amplectens, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Schiedea kealiae, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(ii) 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

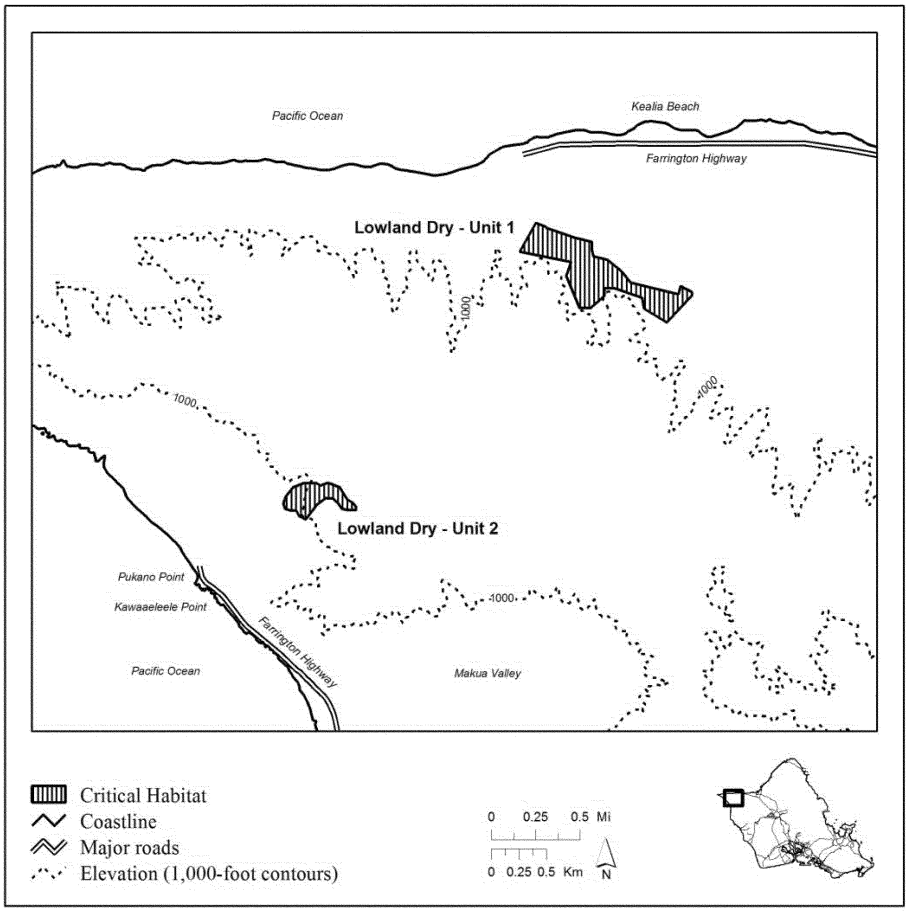


(9) Oahu—Lowland Dry—Unit 1 (102 ac; 41 ha) and Oahu—Lowland Dry—Unit 2 (29 ac; 12).

(i) These units are 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) 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) [Reserved]

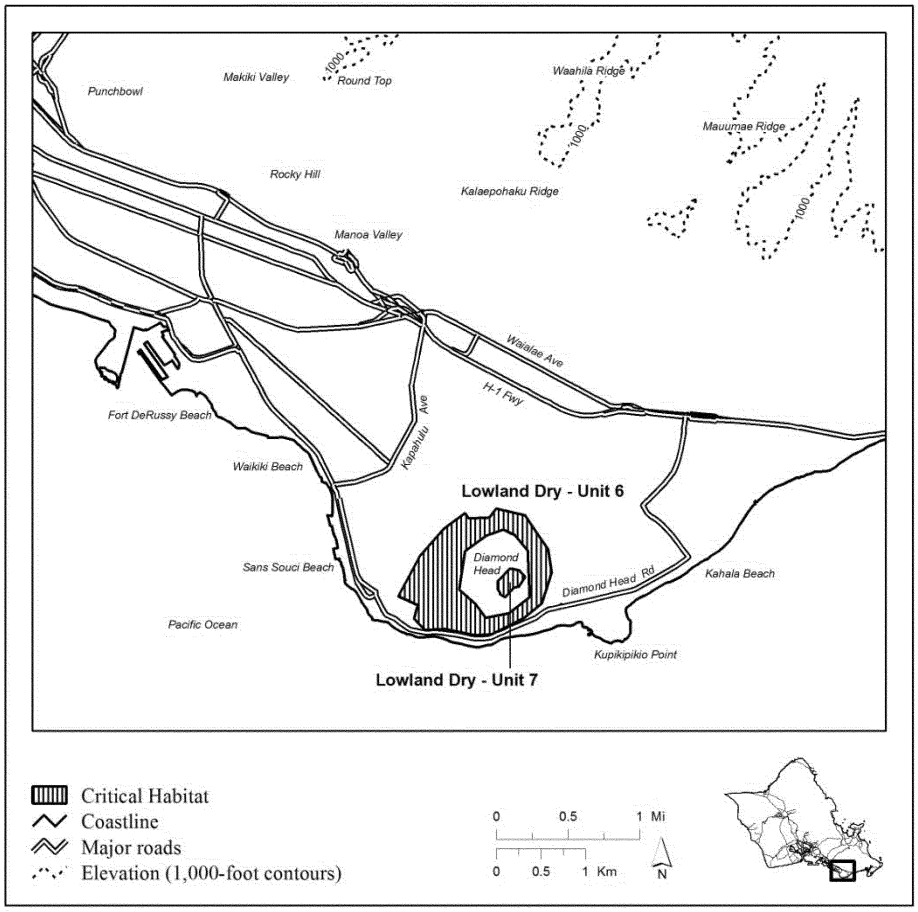
(11) Oahu—Lowland Dry—Unit 6 (287 ac; 116 ha) and Oahu—Lowland Dry—Unit 7 (15 ac; 6 ha).

(i) Oahu—Lowland Dry—Unit 6 is critical habitat for *Doryopteris takeuchii, Gouania meyenii,* and *Spermolepis hawaiiensis.*

(ii) Oahu—Lowland Dry—Unit 7 is critical habitat for *Cyperus trachysanthos, Doryopteris takeuchii, Gouania meyenii, Marsilea villosa,* and *Spermolepis hawaiiensis.*

(iii) Map of Oahu—Lowland Dry—Unit 6 and Oahu—Lowland Dry—Unit 7 (Map 10) follows:

Map 10
Oahu–Lowland Dry
Unit 6 and Unit 7



(12) Oahu—Lowland Dry—Unit 8 (99 ac; 40 ha), Oahu—Lowland Dry—Unit 9 (37 ac; 15 ha), Oahu—Lowland Dry—Unit 10 (43 ac; 17 ha), and Oahu—Lowland Dry—Unit 11 (166 ac; 67 ha).

(i) These units are 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, Schiedea hookeri, Schiedea kealiae,* and *Spermolepis hawaiiensis.*

(ii) Map of Oahu—Lowland Dry—Unit 8, Oahu—Lowland Dry—Unit 9, Oahu—Lowland Dry—Unit 10, and Oahu—Lowland Dry—Unit 11 (Map 11) follows:

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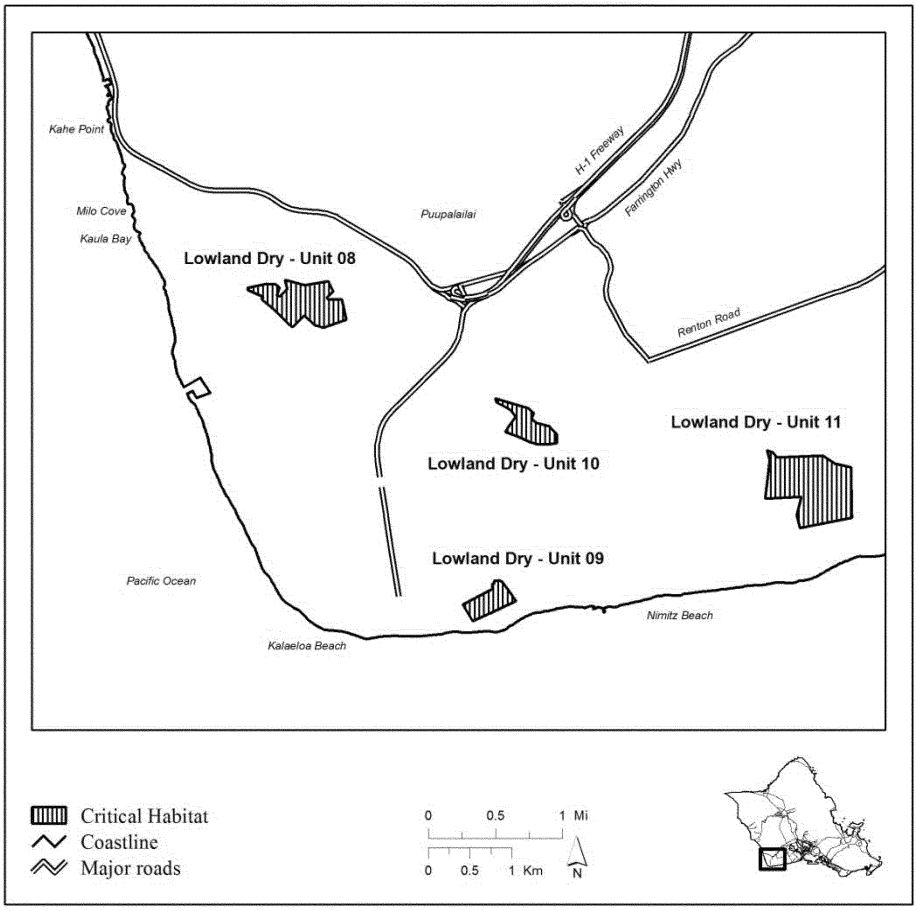
Map 11
Oahu–Lowland Dry
Unit 8, Unit, 9, Unit 10 and Unit 11

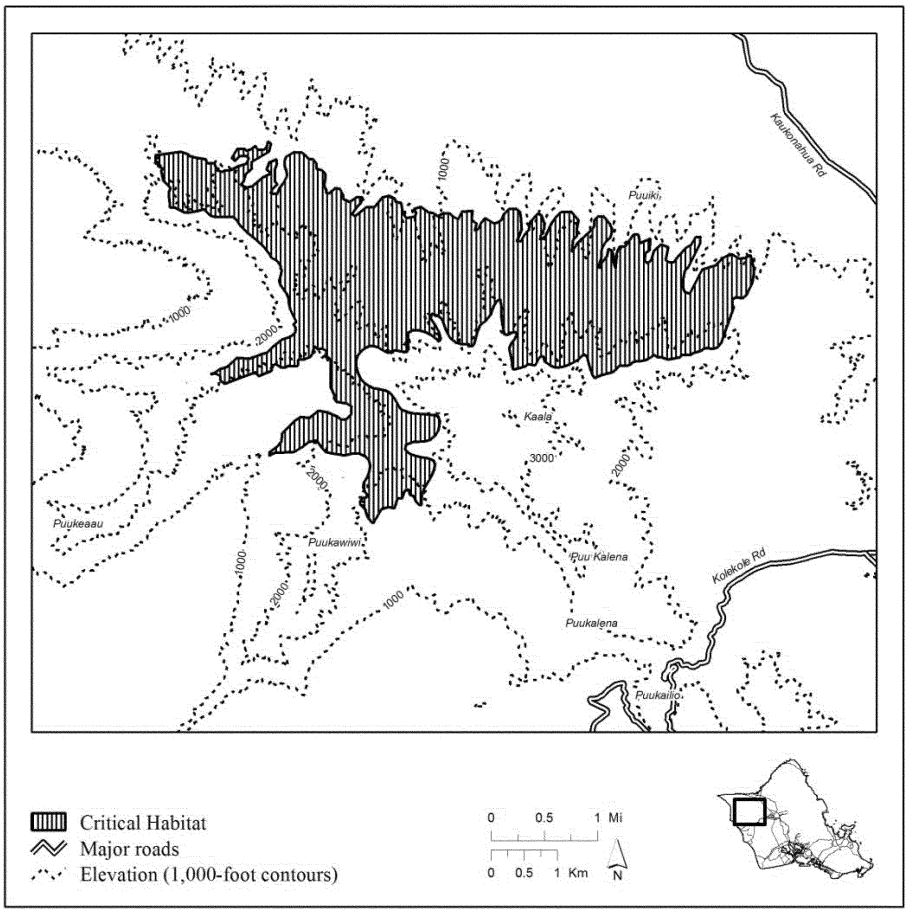


(13) Oahu—Lowland Mesic—Unit 1 (4,448 ac; 1,800 ha).

(i) 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.*

Map of Oahu—Lowland Mesic—Unit 1 (Map 12) follows:

Map 12
Oahu–Lowland Mesic
Unit 1

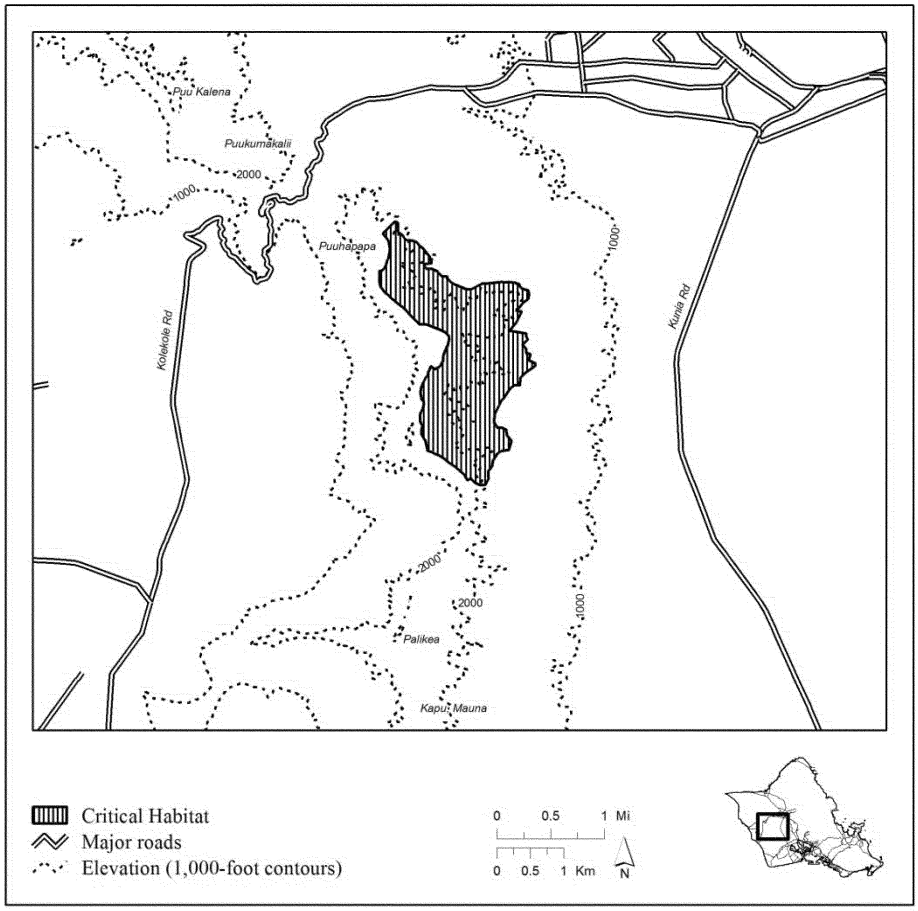


(14) Oahu—Lowland Mesic—Unit 2 (1,063 ac; 430 ha).

(i) 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) Map of Oahu—Lowland Mesic—Unit 2 (Map 13) follows:

Map 13
Oahu–Lowland Mesic
Unit 2

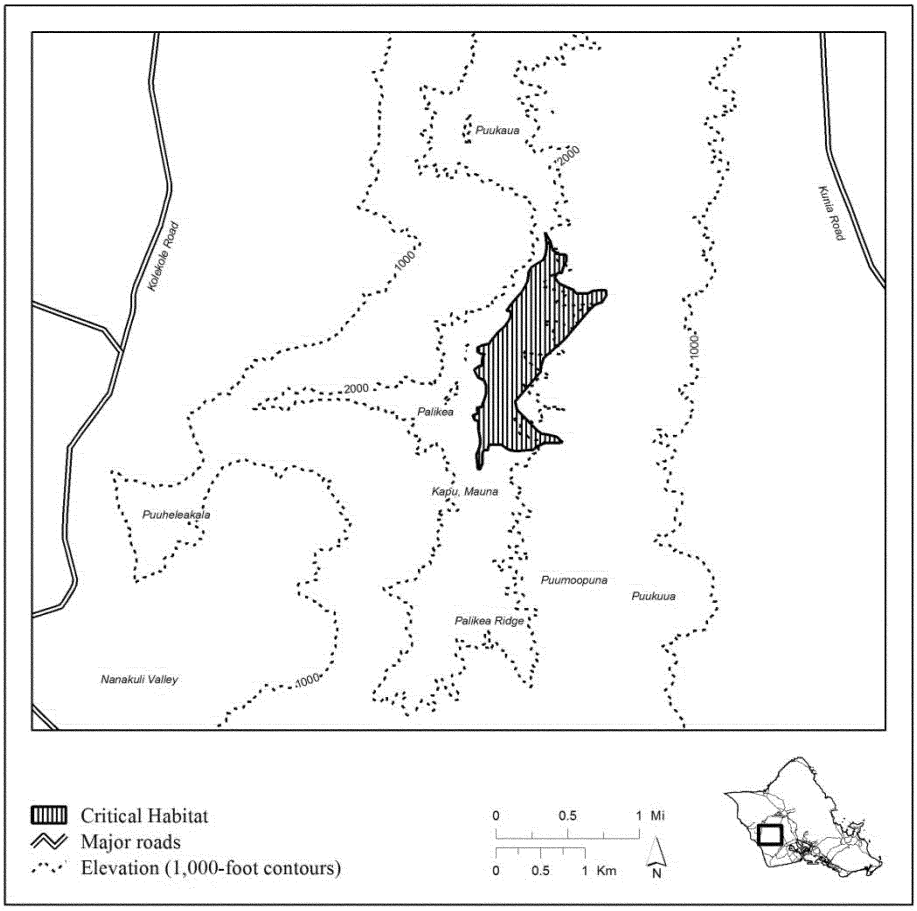


(15) Oahu—Lowland Mesic—Unit 3 (353 ac; 143 ha).

(i) 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, 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) Map of Oahu—Lowland Mesic—Unit 3 (Map 14) follows:

Map 14
Oahu–Lowland Mesic
Unit 3

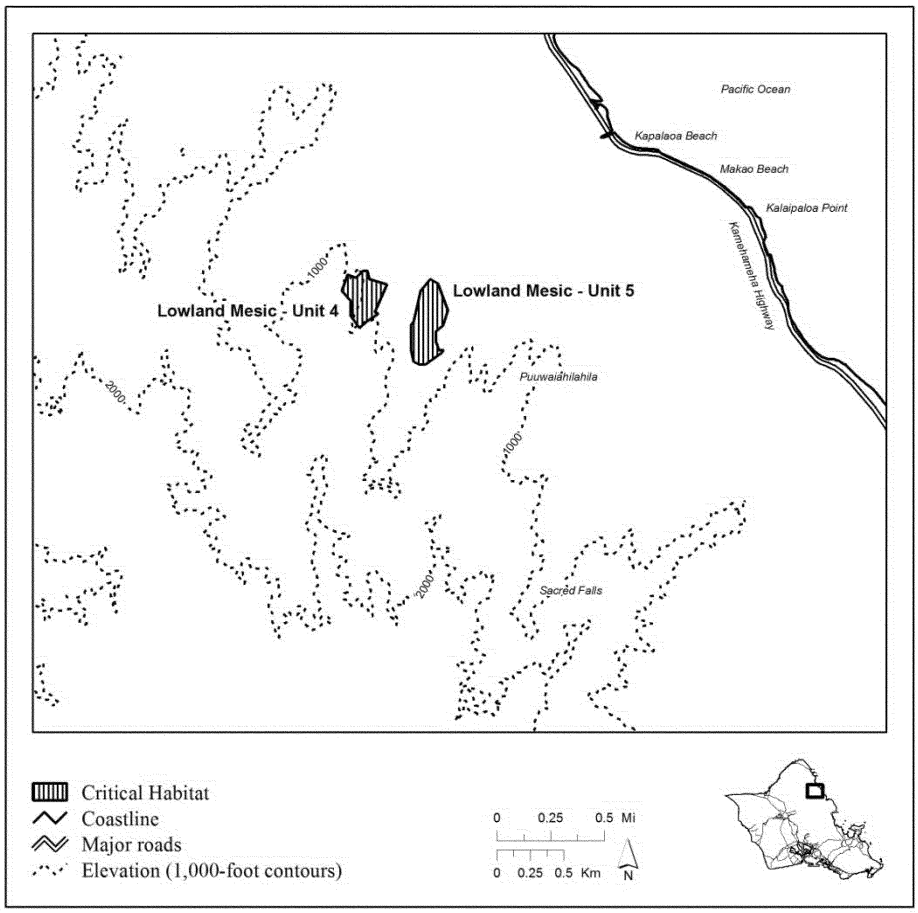


(16) Oahu—Lowland Mesic—Unit 4 (20 ac; 8 ha) and Oahu—Lowland Mesic—Unit 5 (29 ac; 12 ha).

(i) These units are 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, 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) Map of Oahu—Lowland Mesic—Unit 4 and Oahu—Lowland Mesic—Unit 5 (Map 15) follows:

Map 15
Oahu–Lowland Mesic
Unit 4 and Unit 5

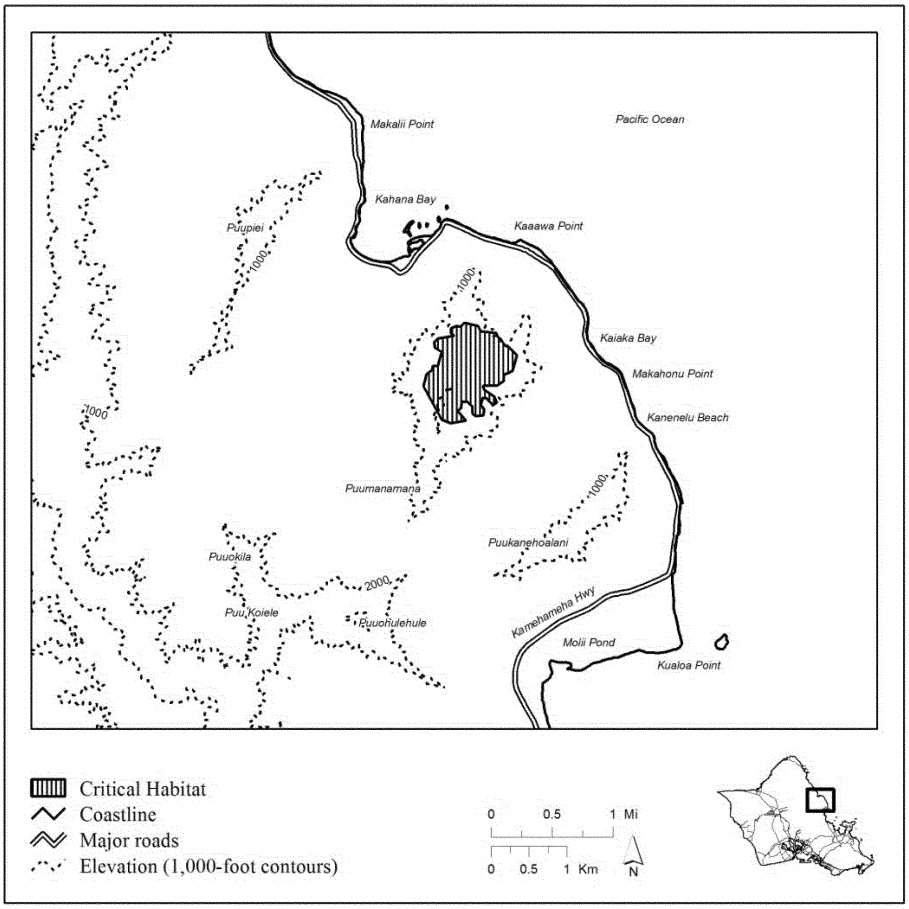


(17) Oahu—Lowland Mesic—Unit 6 (247 ac; 100 ha).

(i) 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, 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) Map of Oahu—Lowland Mesic—Unit 6 (Map 16) follows:

Map 16
Oahu–Lowland Mesic
Unit 6

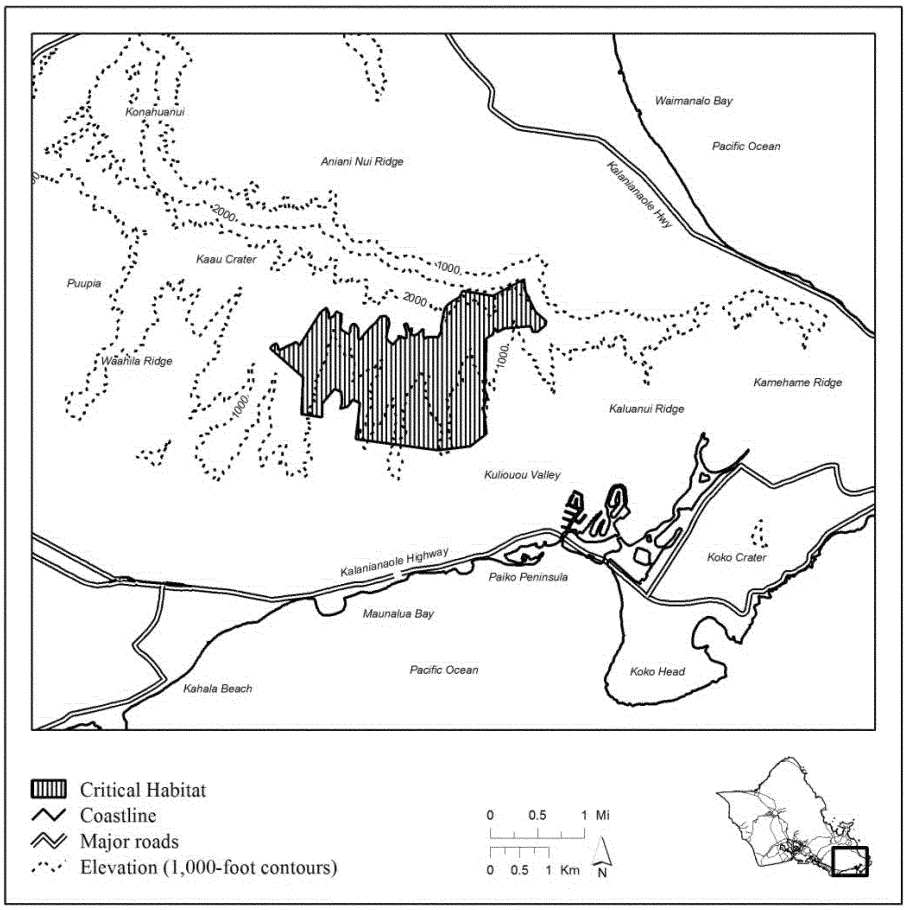


(18) Oahu—Lowland Mesic—Unit 7 (1,669 ac; 676 ha).

(ii) 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, 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) Map of Oahu—Lowland Mesic—Unit 7 (Map 17) follows:

Map 17
Oahu–Lowland Mesic
Unit 7

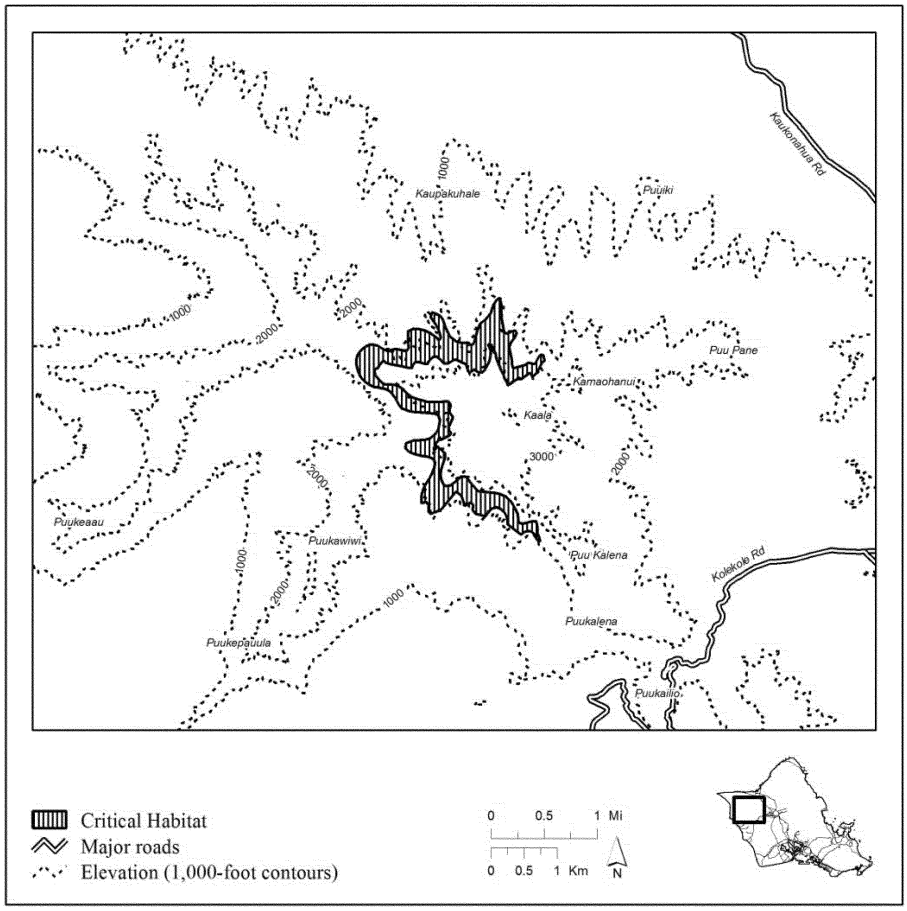


(19) Oahu—Lowland Wet—Unit 1 (541 ac; 219 ha).

(i) 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, Phyllostegia hirsuta, Phyllostegia mollis, Plantago princeps* var. *princeps, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Urera kaalae.*

(ii) Map of Oahu—Lowland Wet—Unit 1 (Map 18) follows:

Map 18
Oahu–Lowland Wet
Unit 1

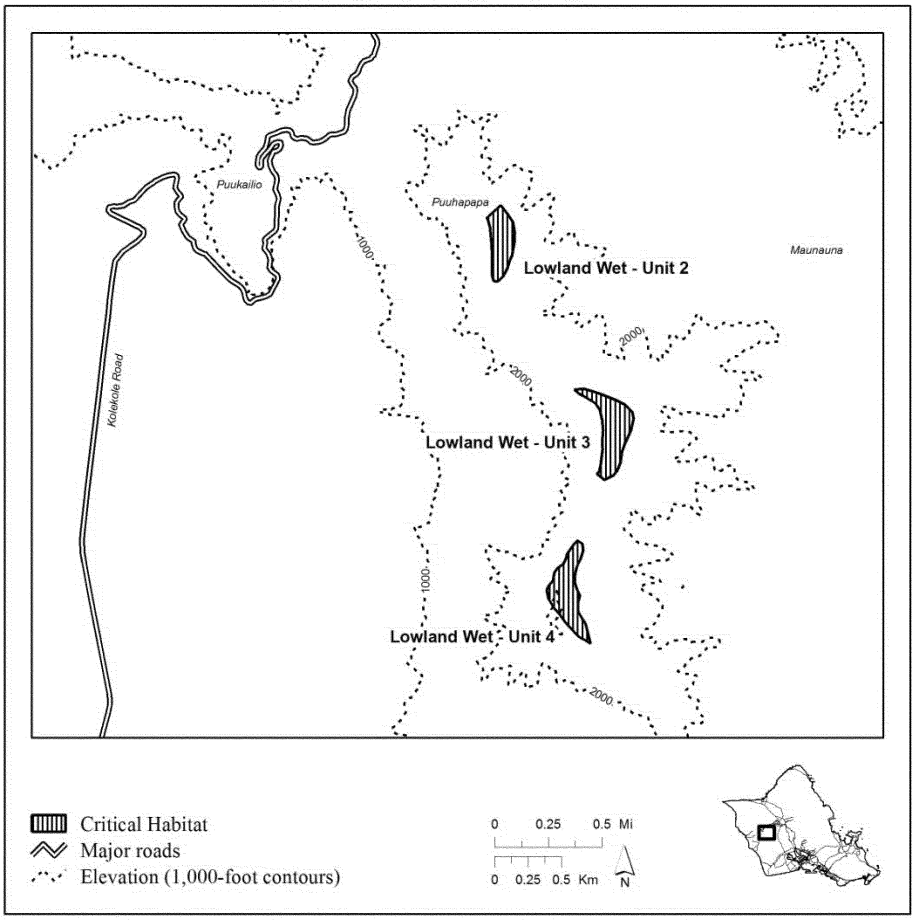


(20) Oahu—Lowland Wet—Unit 2 (20 ac; 8 ha), Oahu—Lowland Wet—Unit 3 (29 ac; 12 ha), and Oahu—Lowland Wet—Unit 4 (27 ac; 11 ha).

(i) These units are 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, Phyllostegia hirsuta, Phyllostegia mollis, Plantago princeps* var. *princeps, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Urera kaalae.*

(ii) Map of Oahu—Lowland Wet—Unit 2, Oahu—Lowland Wet—Unit 3, and Oahu—Lowland Wet—Unit 4 (Map 19) follows:

Map 19
Oahu–Lowland Wet
Unit 2, Unit 3 and Unit 4

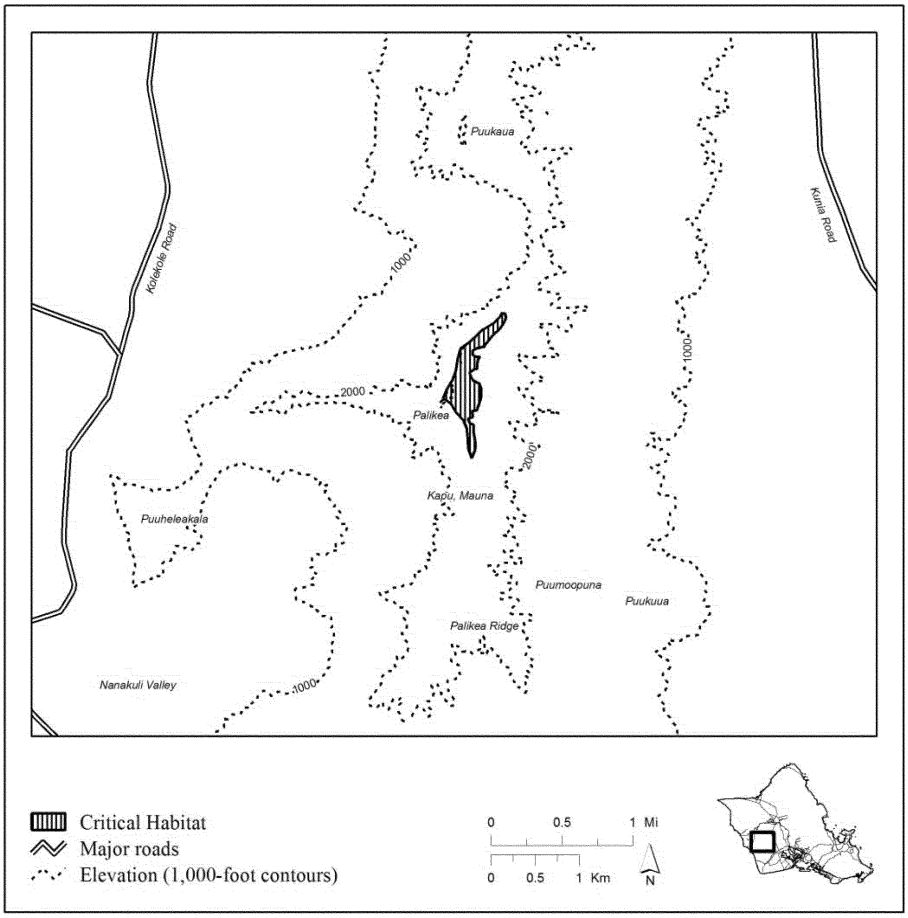


(21) Oahu—Lowland Wet—Unit 5 (74 ac; 30 ha).

(i) 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, Phyllostegia hirsuta, Phyllostegia mollis, Plantago princeps* var. *princeps, Pteralyxia macrocarpa, Schiedea hookeri, Schiedea kaalae,* and *Urera kaalae.*

(ii) Map of Oahu—Lowland Wet—Unit 5 (Map 20) follows:

Map 20
Oahu–Lowland Wet
Unit 5

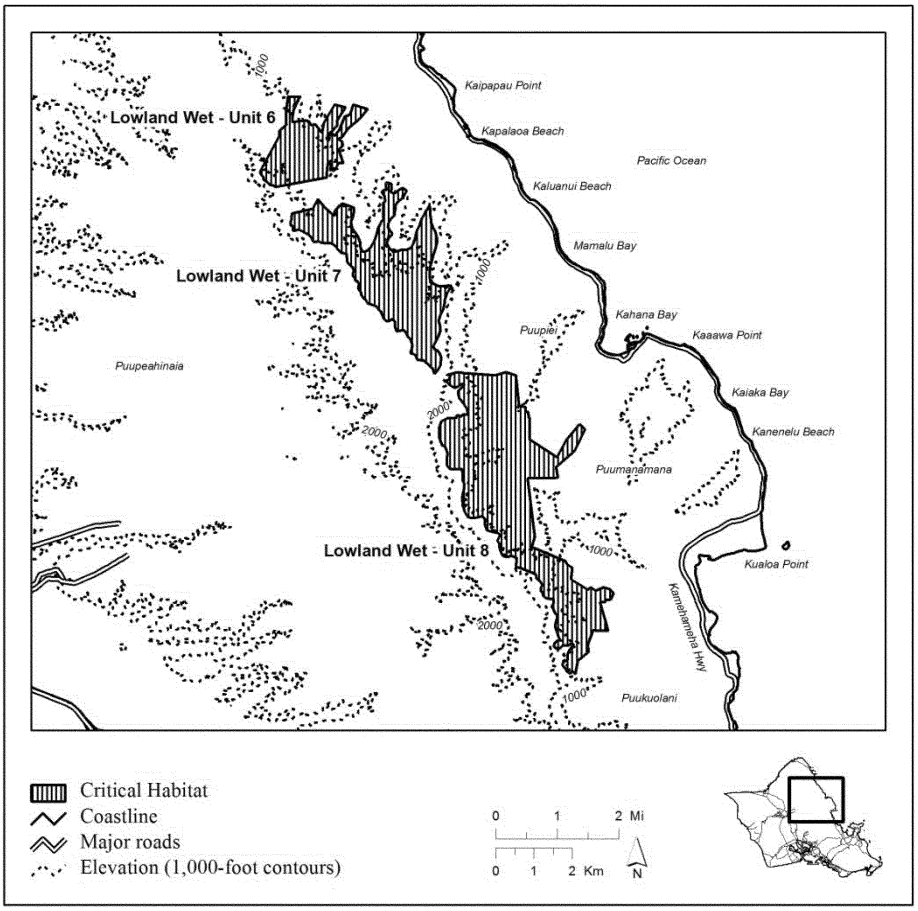


(22) Oahu—Lowland Wet—Unit 6 (790 ac; 320 ha), Oahu—Lowland Wet—Unit 7 (1,787 ac; 723 ha), and Oahu—Lowland Wet—Unit 8 (3,041 ac; 1,231 ha).

(i) These units are 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) Map of Oahu—Lowland Wet—Unit 6, Oahu—Lowland Wet—Unit 7, and Oahu—Lowland Wet—Unit 8 (Map 21) follows:

Map 21
Oahu–Lowland Wet
Unit 6, Unit 7 and Unit 8

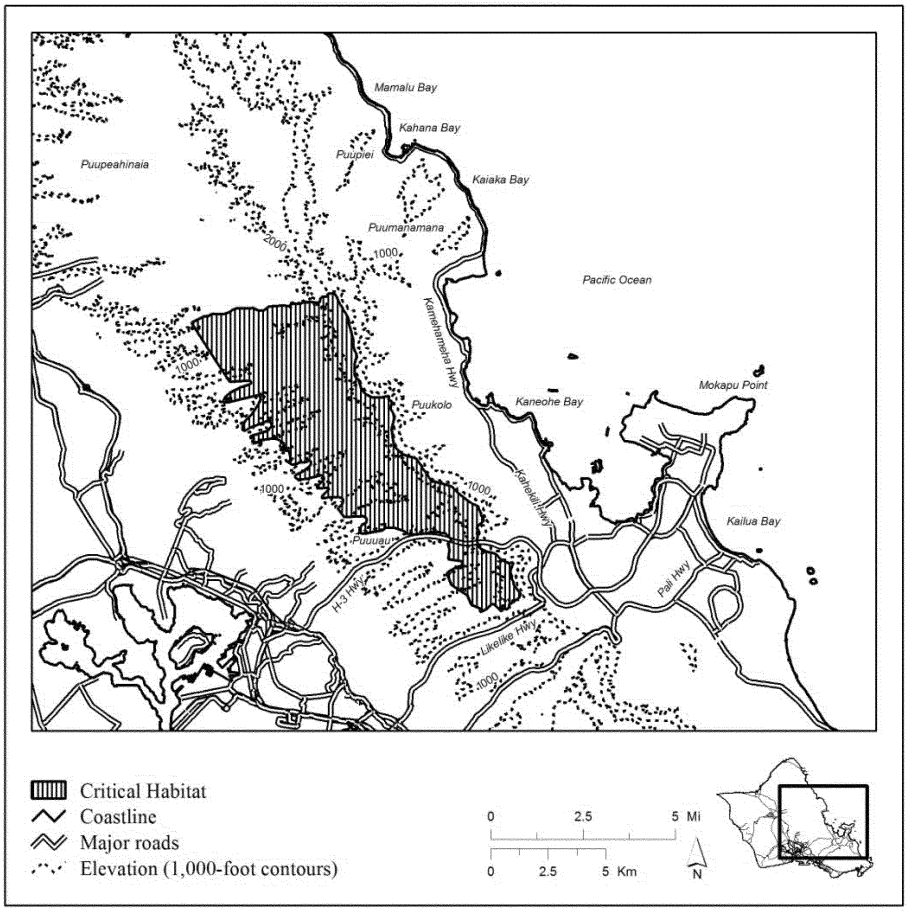


(23) Oahu—Lowland Wet—Unit 9 (15,728 ac; 6,365 ha).

(i) 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) Map of Oahu—Lowland Wet—Unit 9 (Map 22) follows:

Map 22
Oahu–Lowland Wet
Unit 9

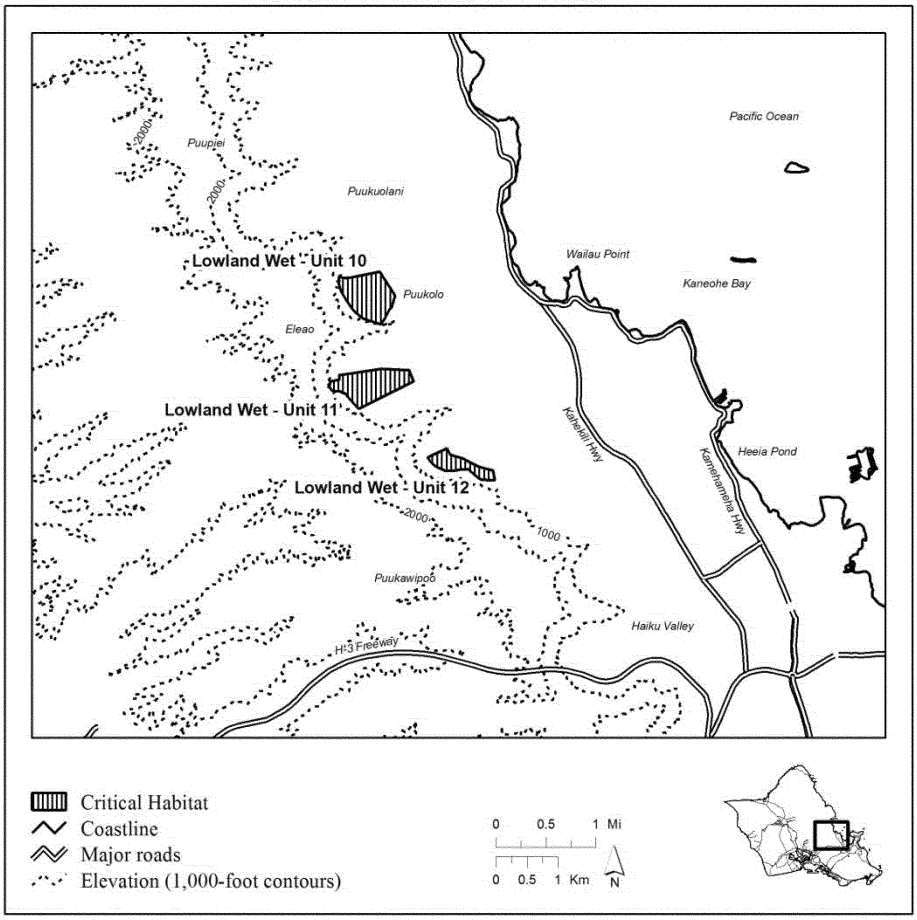


(24) Oahu—Lowland Wet—Unit 10 (124 ac; 50 ha), Oahu—Lowland Wet—Unit 11 (124 ac; 50 ha), and Oahu—Lowland Wet—Unit 12 (53 ac; 21 ha).

(i) These units are 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) Map of Oahu—Lowland Wet—Unit 10, Oahu—Lowland Wet—Unit 11, and Oahu—Lowland Wet—Unit 12 (Map 23) follows:

Map 23
Oahu–Lowland Wet
Unit 10, Unit 11 and Unit 12

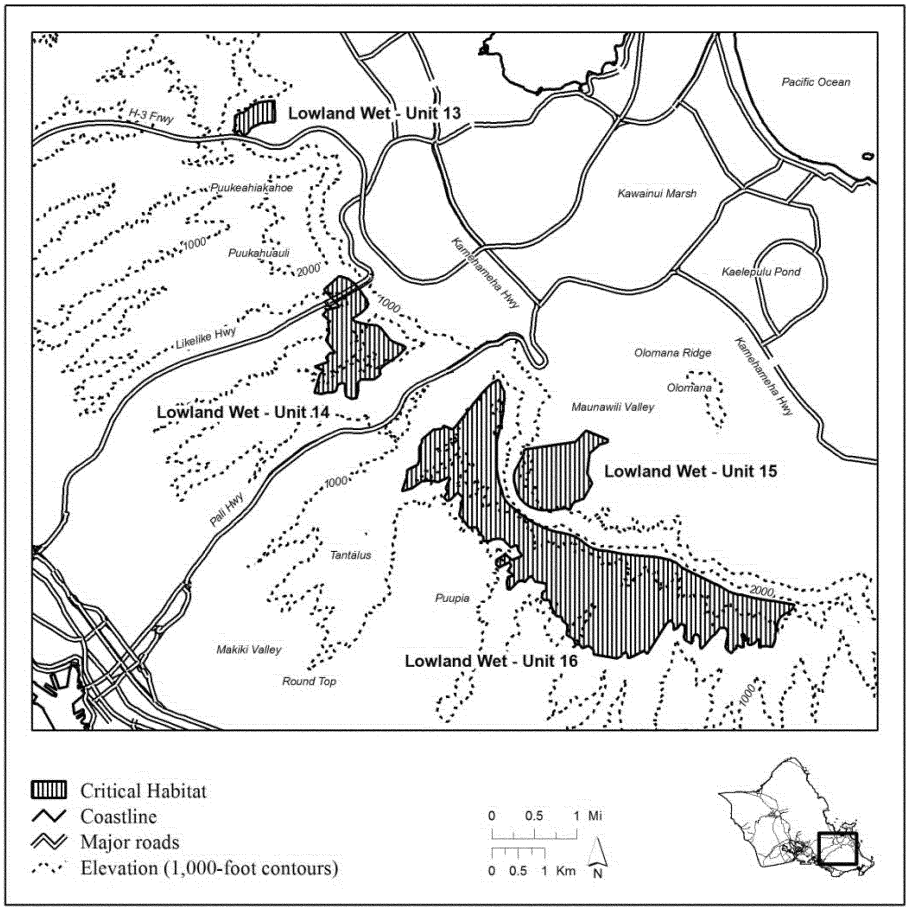


(25) Oahu—Lowland Wet—Unit 13 (75 ac; 30 ha), Oahu—Lowland Wet—Unit 14 (478 ac; 193 ha), Oahu—Lowland Wet—Unit 15 (407 ac; 165 ha), and Oahu—Lowland Wet—Unit 16 (2,507 ac; 1,014 ha).

(i) These units are 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) Map of Oahu—Lowland Wet—Unit 13, Oahu—Lowland Wet—Unit 14, Oahu—Lowland Wet—Unit 15, and Oahu—Lowland Wet—Unit 16 (Map 24) follows:

Map 24
Oahu–Lowland Wet
Unit 13, Unit 14, Unit 15 and Unit 16

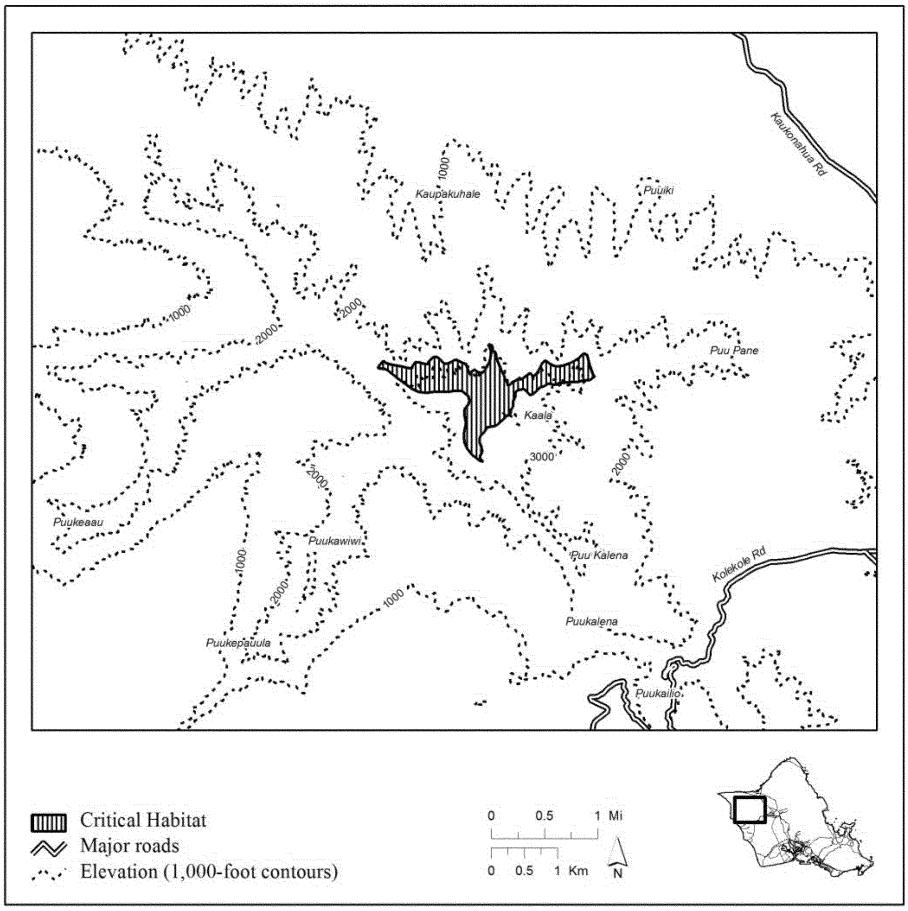


(26) Oahu—Montane Wet—Unit 1 (370 ac; 150 ha).

(i) This unit is critical habitat for *Alectryon macrococcus, Cyanea acuminata, Cyanea calycina, Labordia cyrtandrae, Lobelia oahuensis, Melicope christophersenii, Phyllostegia hirsuta,* and *Schiedea trinervis.*

(ii) Map of Oahu—Montane Wet—Unit 1 (Map 25) follows:

Map 25
Oahu–Montane Wet
Unit 1

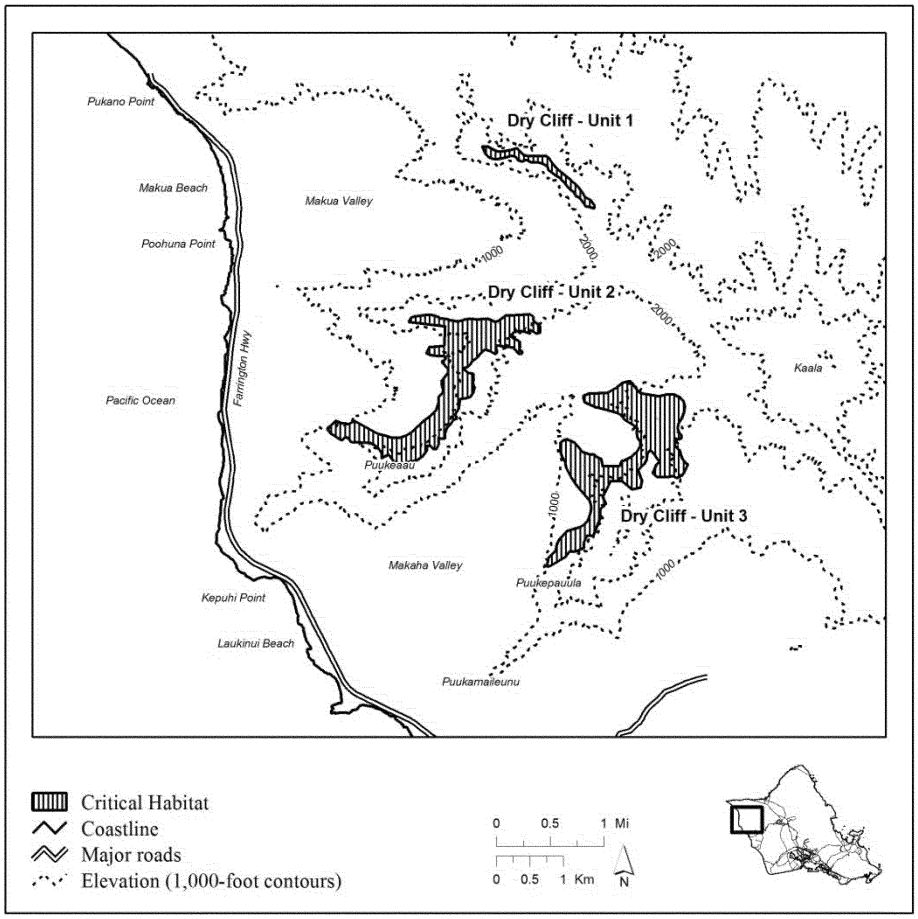


(27) Oahu—Dry Cliff—Unit 1 (49 ac; 20 ha), Oahu—Dry Cliff—Unit 2 (412 ac; 167 ha), and Oahu—Dry Cliff—Unit 3 (450 ac; 182 ha).

(i) These units are 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) Map of Oahu—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, and Oahu—Dry Cliff—Unit 3 (Map 26) follows:

Map 26
Oahu–Dry Cliff
Unit 1, Unit 2 and Unit 3

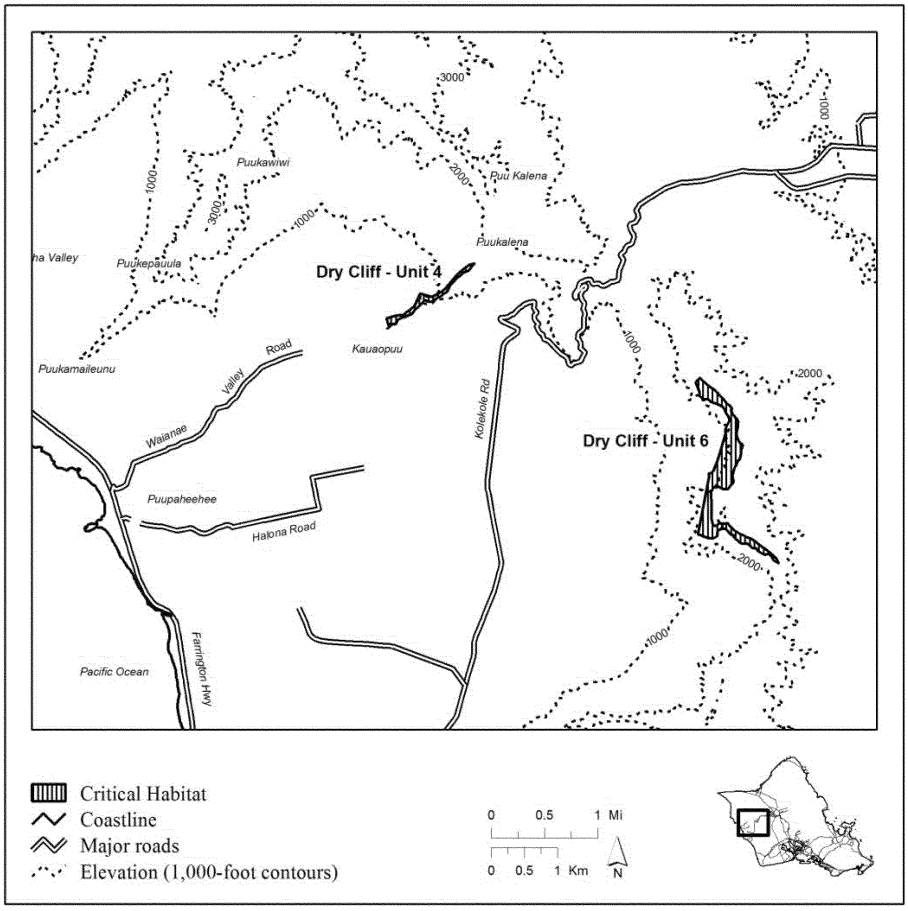


(28) Oahu—Dry Cliff—Unit 4 (24 ac; 10 ha) and Oahu—Dry Cliff—Unit 6 (149 ac; 60 ha).

(i) These units are 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) Map of Oahu—Dry Cliff—Unit 4 and Oahu—Dry Cliff—Unit 6 (Map 27) follows:

Map 27
Oahu–Dry Cliff
Unit 4 and Unit 6

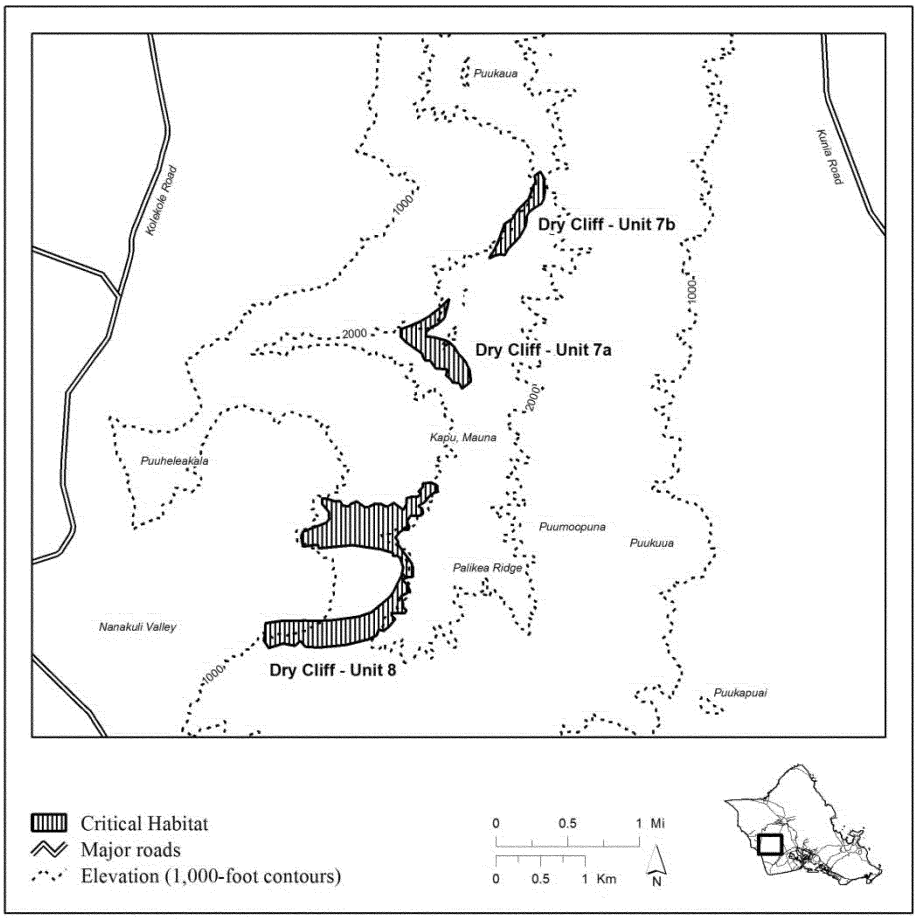


(29) Oahu—Dry Cliff—Unit 7a (68 ac; 27 ha), Oahu—Dry Cliff—Unit 7b (38 ac; 16 ha), and Oahu—Dry Cliff—Unit 8 (259 ac; 105 ha).

(i) These units are 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) Map of Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, and Oahu—Dry Cliff—Unit 8 (Map 28) follows:

Map 28
Oahu–Dry Cliff
Unit 7a, Unit 7b and Unit 8

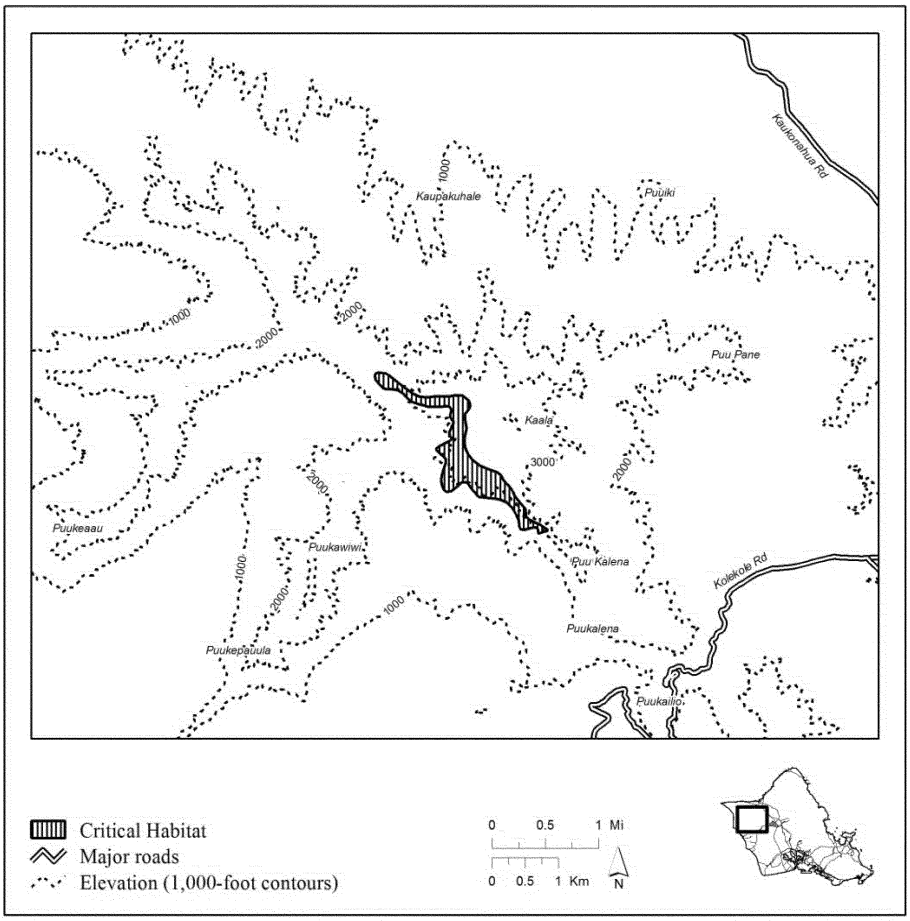


(30) Oahu—Wet Cliff—Unit 1 (235 ac; 95 ha).

(i) 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) Map of Oahu—Wet Cliff—Unit 1 (Map 29) follows:

Map 29
Oahu–Wet Cliff
Unit 1

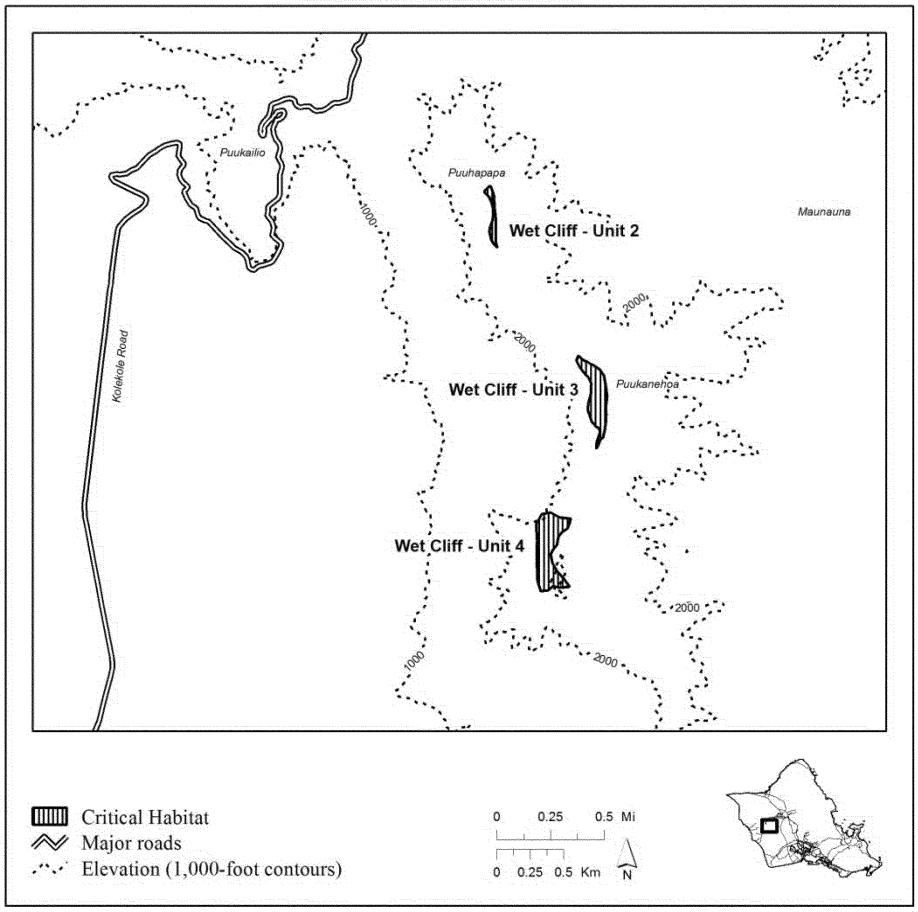


(31) Oahu—Wet Cliff—Unit 2 (3 ac; 1 ha), Oahu—Wet Cliff—Unit 3 (16 ac; 6 ha), and Oahu—Wet Cliff—Unit 4 (23 ac; 9 ha).

(i) These units are 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) Map of Oahu—Wet Cliff—Unit 2, Oahu—Wet Cliff—Unit 3, and Oahu—Wet Cliff—Unit 4 (Map 30) follows:

Map 30
Oahu–Wet Cliff
Unit 2, Unit 3 and Unit 4

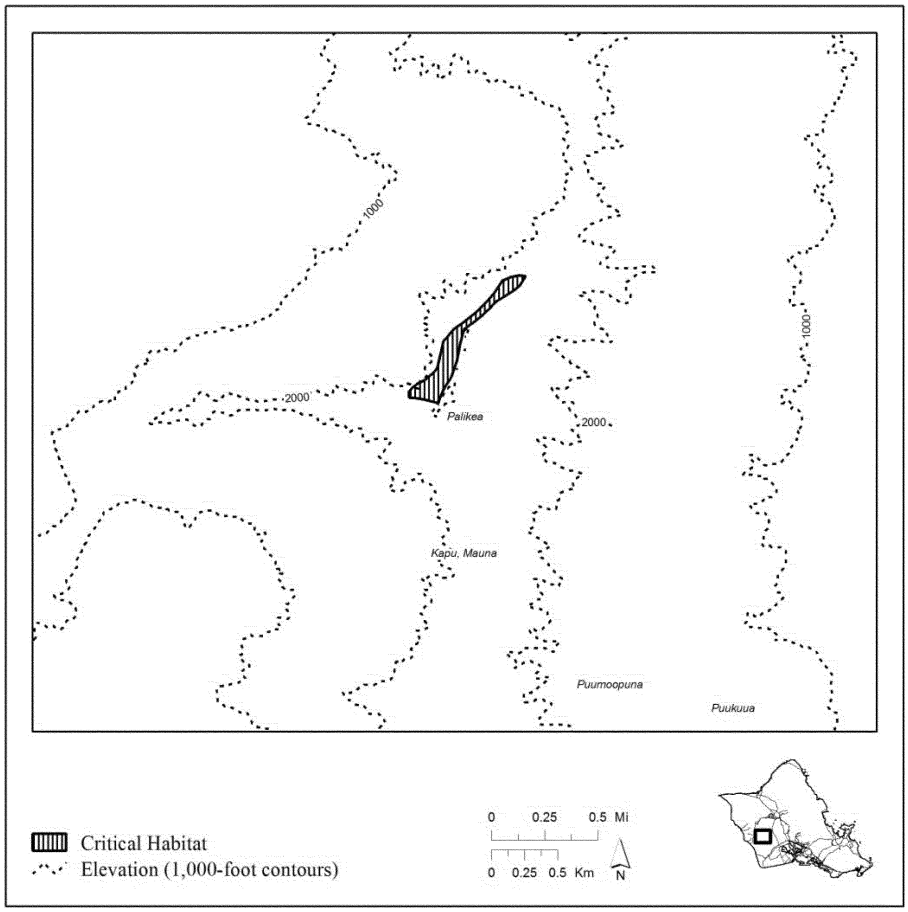


(32) Oahu—Wet Cliff—Unit 5 (31 ac; 13 ha).

(i) 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) Map of Oahu—Wet Cliff—Unit 5 (Map 31) follows:

Map 31
Oahu–Wet Cliff
Unit 5

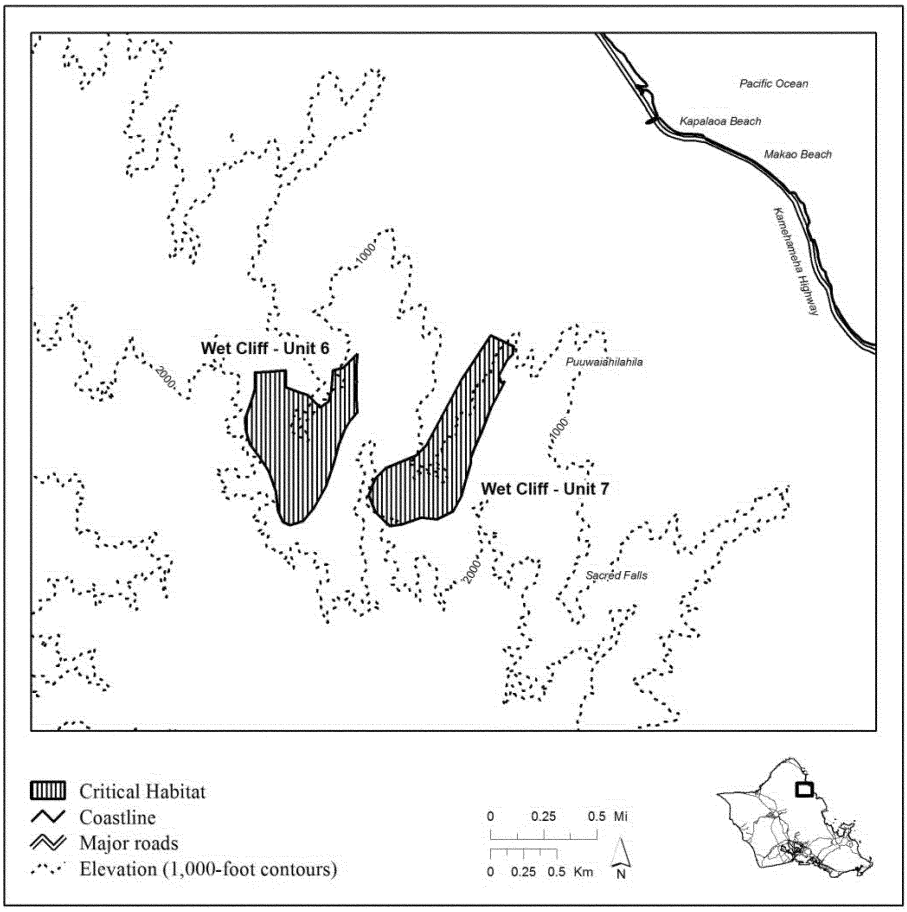


(33) Oahu—Wet Cliff—Unit 6 (151 ac; 61 ha) and Oahu—Wet Cliff—Unit 7 (144 ac; 58 ha).

(i) These units are 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) Map of Oahu—Wet Cliff—Unit 6 and Oahu—Wet Cliff—Unit 7 (Map 32) follows:

Map 32
Oahu–Wet Cliff
Unit 6 and Unit 7



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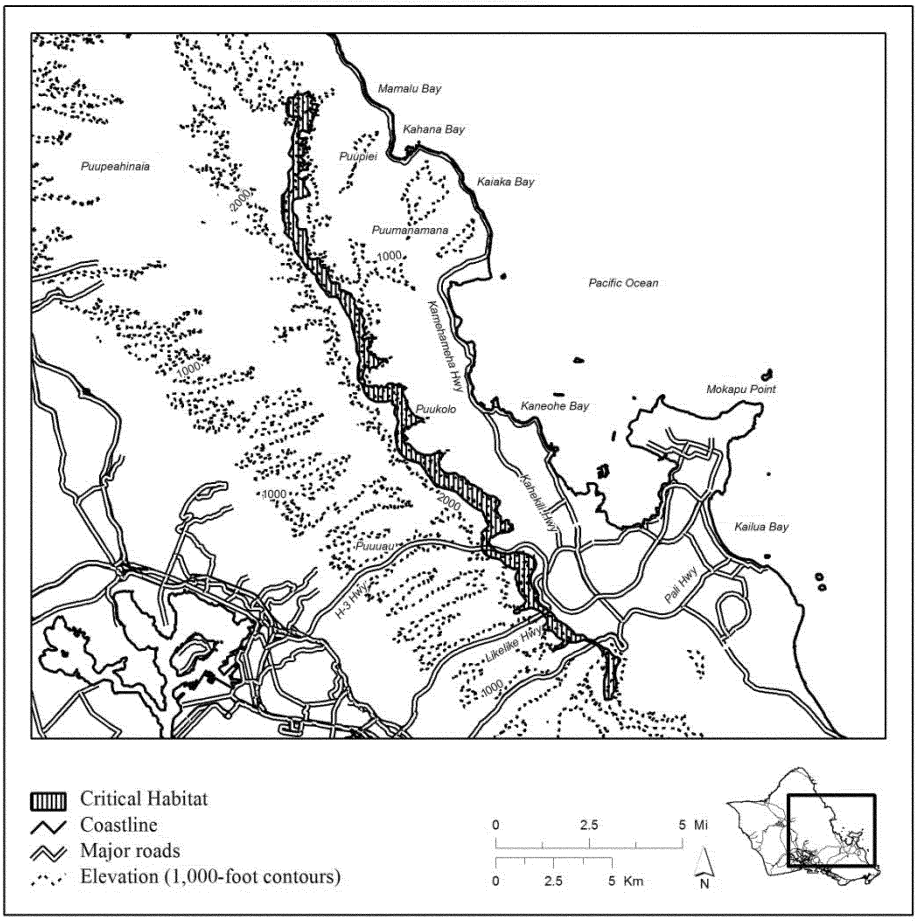
(34) Oahu—Wet Cliff—Unit 8 (4,649 ac; 1,881 ha).

(i) 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) Map of Oahu—Wet Cliff—Unit 8 (Map 33) follows:

Map 33
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

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		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	*Sesbania tomentosa*	*Centaurium sebaeoides* *Chamaesyce kuwaleana* *Sesbania tomentosa* *Vigna o-wahuensis*
Oahu—Coastal—Unit 9	*Cyperus trachysanthos* *Marsilea villosa*	*Centaurium sebaeoides* *Chamaesyce kuwaleana* *Cyperus trachysanthos* *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	*Marsilea villosa*	*Centaurium sebaeoides* *Chamaesyce kuwaleana* *Cyperus trachysanthos* *Marsilea villosa* *Sesbania tomentosa* *Vigna o-wahuensis*
Oahu—Coastal—Unit 12	*Marsilea villosa*	*Centaurium sebaeoides* *Chamaesyce kuwaleana* *Cyperus trachysanthos* *Marsilea villosa* *Sesbania tomentosa* *Vigna o-wahuensis*
Oahu—Coastal—Unit 13	*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 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*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		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		
		Achyranthes splendens var. *rotundata*
		Bidens amplectens
	Bonamia menziesii	*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 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
		Schiedea hookeri
		Schiedea kealiae
		Spermolepis hawaiiensis
Oahu—Lowland Dry—Unit 9		
	Achyranthes splendens var. *rotundata*	*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
		Schiedea hookeri
		Schiedea kealiae
		Spermolepis hawaiiensis

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
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
		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 angulata
		Nototrichium humile
		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 acuminate	*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 dentate	*Cyrtandra dentata*
	Delissea subcordata	*Delissea subcordata*
	Diellia falcate	*Diellia falcata*
		Diellia unisora
		Diplazium molokaiense
	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

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Labordia cyrtandrae
	Lobelia niihauensis	*Lobelia niihauensis*
	Melanthera tenuifolia	*Melanthera tenuifolia*
	Melicope makahae	*Melicope makahae*
	Melicope pallida	*Melicope pallida*
		Melicope saint-johnii
	Neraudia angulate	*Neraudia angulata*
	Nototrichium humile	*Nototrichium humile*
		Phyllostegia hirsuta
	Phyllostegia kaalaensis	*Phyllostegia kaalaensis*
		Phyllostegia mollis
		Phyllostegia parviflora
		Plantago 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 falcate	*Diellia falcata*
		Diellia unisora
		Diplazium molokaiense
		Dubautia herbstobatae
		Eragrostis fosbergii
		Eugenia koolauensis
		Euphorbia haeleeleana
		Flueggea neowawraea
	Gardenia mannii	*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

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Nototrichium humile
	Phyllostegia hirsute	*Phyllostegia hirsuta*
	Phyllostegia kaalaensis	*Phyllostegia kaalaensis*
	Phyllostegia mollis	*Phyllostegia mollis*
		Phyllostegia parviflora
		Plantago 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 falcate	*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
		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	*Phyllostegia parviflora*
	Plantago princeps	*Plantago princeps*
		Platydesma cornuta var. *decurrens*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
	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
		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
		Plantago 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*
		Ctenitis squamigera
		Cyanea acuminata
		Cyanea calycina
		Cyanea crispa
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea lanceolata
		Cyanea longiflora
		Cyanea truncata
		Cyrtandra dentata
		Cyrtandra polyantha
		Delissea subcordata
		Diellia erecta
		Diellia falcata
		Eugenia koolauensis
		Gardenia mannii
		Hesperomannia arborescens
		Isodendrion laurifolium

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Isodendrion longifolium
		Kadua coriacea
		Labordia cyrtandrae
		Lobelia monostachya
		Melicope lydgatei
		Melicope saint-johnii
		Phyllostegia hirsuta
		Phyllostegia mollis
		Phyllostegia parviflora
		Plantago 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 acuminate	*Cyanea acuminata*
		Cyanea calycina
	Cyanea crispa	*Cyanea crispa*
		Cyanea grimesiana ssp. *grimesiana*
		Cyanea lanceolata
		Cyanea longiflora
	Cyanea truncate	*Cyanea truncata*
		Cyrtandra dentata
		Cyrtandra polyantha
		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
		Plantago princeps
		Pleomele forbesii
	Pteralyxia macrocarpa	*Pteralyxia macrocarpa*
	Schiedea kaalae	*Schiedea kaalae*
		Schiedea nuttallii
		Solanum sandwicense
		Tetraplasandra gymnocarpa
		Tetraplasandra lydgatei
Oahu—Lowland Mesic—Unit 7		
		Alectryon macrococcus
	Bonamia menziesii	*Bonamia menziesii*
		Chamaesyce celastroides var. *kaenana*
		Ctenitis squamigera
	Cyanea acuminate	*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*
		Delissea subcordata
	Diellia erecta	*Diellia erecta*
		Diellia falcata

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		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
		Plantago 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
		Phyllostegia hirsuta
		Phyllostegia mollis
		Plantago princeps
		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
		Hesperomannia arbuscula
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia oahuensis
	Phyllostegia hirsute	*Phyllostegia hirsuta*
	Phyllostegia mollis	*Phyllostegia mollis*
		Plantago princeps
		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

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Labordia cyrtandrae
		Lobelia oahuensis
	Phyllostegia hirsute	*Phyllostegia hirsuta*
	Phyllostegia mollis	*Phyllostegia mollis*
		Plantago princeps
		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
		Phyllostegia hirsuta
	Phyllostegia mollis	*Phyllostegia mollis*
		Plantago princeps
		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
		Phyllostegia hirsuta
		Phyllostegia mollis
		Plantago princeps
		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*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Huperzia nutans
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia gaudichaudii ssp. *koolauensis*
		Lobelia oahuensis
		Melicope hiiakae
		Melicope lydgatei
		Myrsine juddii
		Phyllostegia hirsuta
		Phyllostegia parviflora
		Plantago 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 acuminate	*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 truncate	*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	*Huperzia nutans*
		Isodendrion longifolium
		Labordia cyrtandrae
		Lobelia gaudichaudii ssp. *koolauensis*
		Lobelia oahuensis
		Melicope hiiakae
		Melicope lydgatei
	Myrsine juddii	*Myrsine juddii*
	Phyllostegia hirsute	*Phyllostegia hirsuta*
		Phyllostegia parviflora
		Plantago 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*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		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
		Plantago 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
	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 hirsute	*Phyllostegia hirsuta*
	Phyllostegia parviflora	*Phyllostegia parviflora*
	Plantago princeps	*Plantago princeps*
		Platanthera holochila

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
	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
		Melicope lydgatei
		Myrsine juddii
		Phyllostegia hirsuta
		Phyllostegia parviflora
		Plantago 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

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		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* *Plantago 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* *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* *Plantago 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*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		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* *Plantago 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 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*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Phyllostegia hirsuta
		Phyllostegia parviflora
		Plantago 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		
		Adenophorus periens
		Chamaesyce rockii
		Cyanea acuminata
		Cyanea calycina
	Cyanea crispa	*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
		Plantago 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 acuminate	*Cyanea acuminata*
	Cyanea calycina	*Cyanea calycina*
	Cyanea crispa	*Cyanea crispa*
		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*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		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
		Plantago 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*
	Cyanea acuminate	*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 dentate	*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	*Plantago princeps*
		Platydesma cornuta var. *decurrens*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		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
		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
	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 falcate	*Diellia falcata*
		Diellia unisora
	Dubautia herbstobatae	*Dubautia herbstobatae*
	Eragrostis fosbergii	*Eragrostis fosbergii*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
	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 angulate	*Neraudia angulata*
	Nototrichium humile	*Nototrichium humile*
	Peucedanum sandwicense	*Peucedanum sandwicense*
	Phyllostegia kaalaensis	*Phyllostegia kaalaensis*
		Plantago 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*
	Viola chamissoniana ssp. *Chamissoniana*	*Viola chamissoniana* ssp. *chamissoniana*
Oahu—Dry Cliff—Unit 4		
		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
		Platydesma cornuta var. *decurrens*
		Pleomele forbesii
		Pteralyxia macrocarpa
		Sanicula mariversa
		Schiedea hookeri
		Schiedea obovata
		Schiedea trinervis

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Silene lanceolata
		Silene perlmanii
	Spermolepis hawaiiensis	*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 angulate	*Neraudia angulata*
		Nototrichium humile
		Peucedanum sandwicense
		Phyllostegia kaalaensis
	Plantago princeps	*Plantago 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 7a		
		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	*Flueggea neowawraea*
		Gouania meyenii
		Gouania vitifolia
		Isodendrion laurifolium
		Isodendrion pyrifolium
		Kadua degeneri

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
	Kadua parvula	*Kadua parvula*
		Korthalsella degeneri
		Lepidium arbuscula
		Lipochaeta lobata var. *leptophylla*
		Lobelia niihauensis
		Melanthera tenuifolia
		Melicope makahae
	Melicope saint-johnii	*Melicope saint-johnii*
		Neraudia angulata
		Nototrichium humile
		Peucedanum sandwicense
		Phyllostegia kaalaensis
	Plantago princeps	*Plantago 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 7b		*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
		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*
		Viola chamissoniana ssp. *chamissoniana*

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
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 angulate	*Neraudia angulata*
	Nototrichium humile	*Nototrichium humile*
		Peucedanum sandwicense
		Phyllostegia kaalaensis
		Plantago 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

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		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 hirsute	*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
		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
		Plantago 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

(35) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
		Cyrtandra viridiflora
		Huperzia nutans
		Labordia cyrtandrae
		Lobelia oahuensis
		Lysimachia filifolia
		Phyllostegia hirsuta
		Phyllostegia parviflora
		Plantago 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 acuminate	*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*
	Labordia cyrtandrae	*Labordia cyrtandrae*
	Lobelia oahuensis	*Lobelia oahuensis*
	Lysimachia filifolia	*Lysimachia filifolia*
	Phyllostegia hirsute	*Phyllostegia hirsuta*
	Phyllostegia parviflora	*Phyllostegia parviflora*
	Plantago princeps	*Plantago 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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, Plumbago, Sicyos, Sida, Waltheria.*

(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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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, Plumbago, Sicyos, Sida, Waltheria.*

(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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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, bogs.

(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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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, Plumbago, Sicyos, Sida, Waltheria.*

(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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 and Oahu—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Plumbago, Sicyos, Sida, Waltheria.*

(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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 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, Plumbago, Sicyos, Sida, Waltheria.*

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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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, Plumbago, Sicyos, Sida, Waltheria.*

(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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu–Dry Cliff–Unit 7a, Oahu–Dry Cliff–Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 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, Plumbago, Sicyos, Sida, Waltheria.*

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, and 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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, Plumbago, Sicyos, Sida, Waltheria.*

(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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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, 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; seasonal wetlands; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In unit 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, seasonal wetlands.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Plumbago, Sicyos, Sida, Waltheria.*

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 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 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, Plumbago, Sicyos, Sida, Waltheria.*

(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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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, Plumbago, Sicyos, Sida, Waltheria.*

(vii) Coral outcrop substrate.

Euphorbia haeleeleana (AKOKO)

Oahu—Lowland Dry—Unit 1, Oahu—Lowland Dry—Unit 2, 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 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, Plumbago, Sicyos, Sida, Waltheria.*

(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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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).

(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.*

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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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. 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 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, Plumbago, Sicyos, Sida, Waltheria.*

(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).

(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 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).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs and bog hummocks.

(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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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—Dry Cliff—Unit 1, Oahu—Dry Cliff—Unit 2, Oahu—Dry Cliff—Unit 3, Oahu—Dry Cliff—Unit 4, Oahu—Dry Cliff—Unit 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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, and 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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.

(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.*

(vii) Host plants *Sapindus oahuensis* and *Nestigis sandwicensis.*

(2) *Ferns and 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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 6, Oahu—Dry Cliff—Unit 7a, Oahu—Dry Cliff—Unit 7b, 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, 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; seasonal wetlands; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In unit 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, seasonal wetlands.

(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: August 2, 2012.

Eileen Sobek,

Deputy Assistant Secretary for Fish and Wildlife and Parks.

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