



ECONOMIC ANALYSIS OF
CRITICAL HABITAT
DESIGNATION FOR
THREE BIG ISLAND PLANTS

DRAFT REPORT | March 13, 2013

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LIST OF ACRONYMS AND ABBREVIATIONS

Act	Endangered Species Act
BMPs	Best Management Practices
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
Department	Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
DOI	U.S. Department of the Interior
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
IRC	Internal Revenue Code
HCP	Habitat Conservation Plan
HUD	U.S. Department of Housing and Urban Development
KCDP	Kona Community Development Plan
LUPAG	Land Use Pattern Allocation Guide
NAICS	North American Industry Classification System
OMB	White House Office of Management and Budget
PCEs	Primary Constituent Elements
RFA	Regulatory Flexibility Act
SBA	Small Business Administration
SBREFA	Small Business Regulatory Enforcement Fairness Act
Service	U.S. Fish and Wildlife Service
TMK	Tax Map Key

TOD	Transit-Oriented Development
Trust	Queen Lili`uokalani Trust
UMRA	Unfunded Mandates Reform Act
WVA	Waikoloa Village Association

EXECUTIVE SUMMARY

1. The purpose of this report is to evaluate the potential economic impacts associated with the designation of critical habitat for three plant species (*Bidens micrantha* ssp. *Ctenophylla*, *Isodendrion pyrifolium* and *Mezoneuron kawaiense*) on Hawaii Island (Big Island). This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service (Service). The information contained in this report is intended to assist the Secretary of the U.S. Department of the Interior (DOI) in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.¹
2. This analysis describes protections provided by Federal, state and local statutes and regulations that may affect proposed critical habitat areas, including the listing of the species under the Act, that are not generated by or affected by critical habitat designation for the plants. These are “baseline” protections afforded the species regardless of the designation of critical habitat. Thus the analysis will not quantify the impacts associated with baseline protections, but will describe them qualitatively.
3. The discussion of the baseline protections provides context for the evaluation of the economic impacts of critical habitat designation, which are the focus of this analysis. These “incremental” economic impacts are those that are not expected to occur absent the designation of critical habitat. This analysis considers the potential for both direct and indirect incremental impacts of the designation. Direct incremental costs are associated with additional effort for consultations, reinitiated consultations, new consultations occurring specifically because of the designation, and additional conservation efforts that would not result from compliance with the section 7 prohibition on jeopardizing the species. Indirect costs are those that may result from the influence of critical habitat designation on the decisions of regulators and decision-makers other than the Service (e.g., state agencies and land managers) or the behavior of the public. We provide a qualitative evaluation of potential economic benefits in Chapter 2.

OVERVIEW OF THE PROPOSED CRITICAL HABITAT AND STUDY AREA

4. On October 2, 2012, the Service published a Proposed Rule to list 15 species (13 plants, one insect, and one crustacean) on the Big Island as endangered and to designate critical habitat for three plant species under the Endangered Species Act (“Act”).² One of the plant species, *Bidens micrantha* ssp. *Ctenophylla*, is concurrently being proposed for

¹ 16 U.S.C. §1533(b)(2).

² 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63928.

listing. The other two plant species (*Isodendrion pyriformium* and *Mezoneuron kawaiense*) were previously listed as endangered but do not have designated critical habitat on the Big Island. Critical habitat was previously proposed for *Isodendrion pyriformium* on the Big Island, but was excluded from the final designation under section 4(b)(2) of the Act.³

5. The proposed critical habitat designation includes seven multi-species units, totaling 18,766 acres (7,597 hectares) within Hawaii’s lowland dry ecosystem.⁴ The Proposed Rule describes each of the units as being occupied by one or more of the three plants. The plants do not necessarily occur across the entirety of each unit; portions of each occupied unit are not considered occupied by the relevant plant species.⁵
6. In addition, the Proposed Rule identifies several areas as “under consideration for exclusion” from the final critical habitat designation under section 4(b)(2) of the Act. These areas include:
 - Unit 31: 2,834 acres associated with Kamehameha Schools
 - Unit 33: 502 acres associated with Palamanui Global Holdings, LLC
 - Unit 34: 630 acres associated with the Kaloko Makai Development and 47 acres associated with Lanihau Properties; and
 - Unit 35: 87 acres associated with the Department of Hawaiian Home Lands’ Villages of La’i’opua.

The proposed critical habitat and the areas under consideration for exclusion are identified in Exhibit ES-1.⁶ Our analysis separately presents impacts in the areas being considered for exclusion from the remainder of the area proposed for designation.

7. Overall, approximately 64 percent of the proposed designation is owned by the State of Hawaii; approximately 34 percent is privately-owned; approximately two percent comprises Federal land managed by the National Park Service; and less than one percent is owned by the County of Hawaii.⁷

³ 2003 Final Critical Habitat Rule, 68 FR 39624

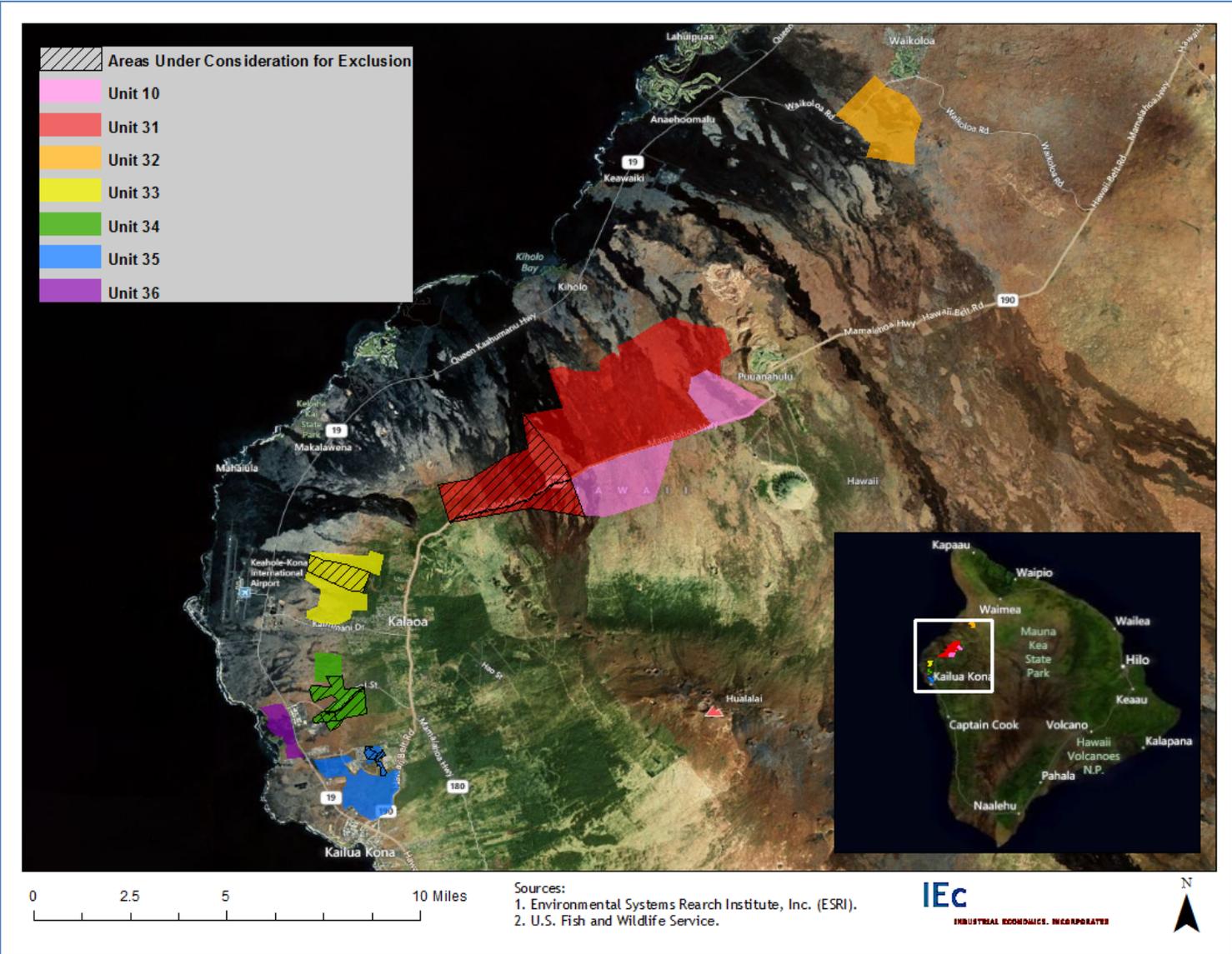
⁴ 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63928.

⁵ Personal communication from the Service on January 15, 2013.

⁶ The 2003 Big Island critical habitat designation (68 FR 39624, Final Critical Habitat Rule) includes units numbered 1-30. The 2012 proposed designation includes Section 1 (which consists of a portion of existing plant critical habitat in Unit 10, and newly proposed critical habitat in Unit 31), as well as units 31-36.

⁷ 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63983.

EXHIBIT ES-1. OVERVIEW OF BIG ISLAND PROPOSED CRITICAL HABITAT



OVERVIEW OF ECONOMIC ACTIVITIES EVALUATED

8. This analysis focuses on the economic activities that are occurring or have the potential to occur within the proposed critical habitat area and, according to the Service, are of primary concern with respect to potential adverse modification of critical habitat.⁸ These activities are :
1. **Development:** Development (commercial, residential, industrial) is considered a threat to the physical or biological features essential to the conservation of the three plant species. In particular, in the increasingly urbanized region of north Kona, development threatens to degrade or destroy the lowland dry ecosystem where the plants occur.⁹
 2. **Transportation projects:** Transportation projects occurring within the proposed critical habitat include expansion of a new highway. This project also poses a threat to the critical habitat for the same reasons as development activities.¹⁰
9. We did not identify any grazing or farming activities occurring or proposed within the area proposed for critical habitat designation. In addition, no renewable energy projects were identified as planned or proposed within proposed critical habitat.¹¹ Our analysis therefore focuses on potential impacts to development and transportation projects. Within these activity categories, we focus our analysis on those projects that are considered reasonably likely to occur within the proposed critical habitat area. This includes projects or activities that are currently planned or proposed, or that permitting agencies or land managers indicate are likely to occur.

SUMMARY OF KEY FINDINGS

10. Critical habitat may generate incremental economic impacts through implementation of additional conservation measures (beyond those implemented in conjunction with the prohibition on jeopardy to the species) and additional administrative effort in section 7 consultations to consider adverse modification. The presence of the three plants across the designation provides extensive baseline protection that includes offsetting habitat loss (i.e. acquiring, restoring, and managing habitat, in perpetuity, to compensate for habitat disturbed).^{12,13} Within occupied areas of the designation, it is unlikely that critical habitat will change the outcome of future section 7 consultations on projects or activities, and incremental impacts will most likely be limited to the additional administrative effort of considering adverse modification as part of consultation.
11. Within unoccupied areas of the designation, all costs associated with conservation efforts recommended in section 7 consultation, as well as the administrative costs of section 7

⁸ Personal communication with the Service on December 19, 2012.

⁹ 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63983.

¹⁰ Personal communication with the Service on December 19, 2012.

¹¹ Personal communication with Hawaii State Energy Office on February 11, 2013.

¹² *Ibid.*

¹³ Note that the exact nature of the Service's recommendations would be determined during section 7 consultation and would depend on the specific nature of the proposed project.

consultation, are direct incremental costs of the critical habitat designation. As the projects and activities occurring within occupied habitat areas are less likely to be directly affected by the critical habitat designation (i.e., impacts are most likely limited to administrative costs), our analysis focuses on the two projects identified as planned to occur within unoccupied areas of the proposed critical habitat designation: a Department of Hawaiian Home Lands (Department) residential project overlapping proposed critical habitat Unit 33, and a Queen Lili'uokalani Trust (Trust) mixed-use development project overlapping proposed critical habitat Unit 35.

12. The Department's project is likely to be subject to section 7 consultation. However, significant uncertainty exists regarding the extent of conservation efforts that the Department will ultimately undertake to avoid adverse modification of critical habitat. The Service has indicated that it may recommend the Department set aside, restore (if necessary), and manage, in perpetuity, 50 to 150 acres within critical habitat.^{14,15} According to the Service, the offsetting could include a combination of onsite areas (on the portion of the project sites overlapping proposed critical habitat) and offsite areas elsewhere within the proposed critical habitat.¹⁶ The Department anticipates that this level of conservation offset would be infeasible and emphasizes their purpose, which is to provide Native Hawaiians with affordable housing via their homesteading program.¹⁷ The Service and Department are planning to meet to discuss the proposed development and how to avoid adverse modification of critical habitat. As the outcome of this meeting is currently unknown, this analysis does not quantify the potential direct impacts of conservation efforts implemented as a result of section 7 consultation on this project. We highlight, however, that this project is expected to be directly affected by the critical habitat designation.
13. The Trust's project is unlikely to be subject to a Federal nexus compelling section 7 consultation.¹⁸ The project may, however, be subject to indirect impacts including additional management by the county associated with required zoning changes. While it is uncertain what conservation efforts the county may require as a result of the critical habitat designation, the Trust emphasizes its fiduciary responsibilities to its beneficiaries (orphaned and destitute Native Hawaiian children and their families) and the positive social, cultural, and economic aspects of its development, as planned. The potential indirect impacts to this project are described in detail in Section 2.6 of this report.
14. Quantified impacts of the proposed designation reflect administrative effort of considering critical habitat in future section 7 consultations on eight projects that are identified both as likely to occur within critical habitat and likely to involve a Federal

¹⁴ Note that the exact nature of the Service's recommendations would be determined during section 7 consultation and would depend on the specific nature of the proposed project.

¹⁵ Personal communication with the Service on February 13, 2013.

¹⁶ Personal communication with the Service on February 26, 2013.

¹⁷ Personal communication with Department of Hawaiian Home Lands on February 25, 2013.

¹⁸ Personal communication with the Queen Liliuokalani Trust on February 28, 2013.

nexus compelling section 7 consultation.¹⁹ Specifically, for areas proposed for critical habitat designation, we estimate a total present value impact of \$35,000 over the next ten years (an annualized impact of \$4,700, seven percent discount rate) associated with future section 7 consultations. Impacts on projects occurring in areas being considered for exclusion are expected to be \$15,000 (an annualized impact of \$2,000, seven percent discount rate).

EXHIBIT ES-2. INCREMENTAL IMPACTS OF CRITICAL HABITAT (2013-2022, 2013 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE IMPACTS (2013-2022)	ANNUALIZED IMPACTS	UNQUANTIFIED IMPACTS ²
AREAS PROPOSED FOR CRITICAL HABITAT DESIGNATION			
Unit 10	\$0	\$0	
Unit 31	\$0	\$0	
Unit 32	\$0	\$0	X
Unit 33	\$20,000	\$2,700	X
Unit 34	\$5,000	\$670	X
Unit 35	\$10,000	\$1,300	X
Unit 36	\$0	\$0	
Total Proposed for Designation	\$35,000	\$4,700	
AREAS BEING CONSIDERED FOR EXCLUSION			
Unit 10	\$0	\$0	
Unit 31	\$0	\$0	
Unit 32	\$0	\$0	
Unit 33	\$5,000	\$670	X
Unit 34	\$5,000	\$670	X
Unit 35	\$5,000	\$670	X
Unit 36	\$0	\$0	
Total Being Considered for Exclusion	\$15,000	\$2,000	
Notes: 1. The level of effort per consultation and the potential costs of project modifications represent approximate averages based on the best available cost information, as described in Exhibit B-1 of Appendix B. The cost estimates in this report are accordingly rounded to two significant digits to reflect this imprecision. The cost estimates may therefore not sum to the total costs reported due to rounding. 2. Unquantified impacts are discussed in section 2.6 of the report.			

15. In addition, this analysis describes the potential indirect effects of the proposed critical habitat designation on projects identified as occurring within proposed critical habitat Units 32 through 35, as noted in Exhibit ES-2. Significant uncertainty regarding the

¹⁹ Two additional projects were identified as occurring within proposed critical habitat for which we do not forecast any costs association with future section 7 consultation due to the lack of Federal nexus.

likelihood, scope, and scale of these impacts limits our ability to monetize the economic costs. The analysis, however, provides a qualitative characterization of these categories of impact to be considered alongside the quantified impacts in this analysis.

ASSUMPTIONS AND LIMITATIONS

16. Exhibit ES-3 summarizes the major assumptions and caveats underlying the analysis of impacts to development and transportation projects. Overall, these uncertainties result in an underestimate of the quantified impacts of the designation reported in this analysis.

EXHIBIT ES-3. ASSUMPTIONS AND LIMITATIONS OF THE ANALYSIS

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS OF QUANTIFIED IMPACTS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
For the Department of Hawaiian Home Lands' project occurring in proposed critical habitat Unit 33 (the only project identified as likely to occur in proposed critical habitat for which there is likely to be a Federal nexus), it is currently uncertain what conservation efforts will ultimately be employed due to the presence of critical habitat.	May result in an underestimate of costs.	Potentially major. The Service has suggested it may recommend offsetting habitat disturbance associated with the Department's development through conservation of 50 to 150 acres elsewhere within the critical habitat area. The Department has suggested this would be infeasible. The Service and the Department plan to discuss an approach to conservation that will avoid adverse modification of critical habitat. The outcome of those discussions is uncertain. Any costs of the conservation for the Big Island plant species would be incremental costs of the critical habitat designation as the area is not occupied by the plant species.
Potential for portions of the designation to be reclassified as Conservation District lands is unknown.	May result in an underestimate of costs.	Potentially major. In the case that the State redistricts lands to the Conservation District as a result of critical habitat, future land use opportunities may be restricted and the value of the land reduced.
Potential for critical habitat to result in conservation requirements or environmental assessments as part of a zoning change request is unknown.	May result in an underestimate of costs.	Potentially major. In the case the County requires landowners to implement conservation measures or conduct environmental assessments as a result of critical habitat, indirect economic impacts would result.

ORGANIZATION OF THE REPORT

17. This report is organized into two chapters. Chapter 1 provides background on the proposed critical habitat rule as well as an overview of the framework of the analysis. Chapter 2 provides the analysis of potential incremental economic impacts of critical habitat designation. This report also includes five appendices: Appendix A addresses additional statutory requirements for this analysis in accordance with relevant executive orders and regulations; Appendix B provides a detailed discussion of the framework of the analysis; Appendix C describes the sensitivity of results to discount rates; Appendix D presents undiscounted impacts; and Appendix E provides the Service's memorandum to IEC describing potential changes in conservation recommendations for these species due to critical habitat designation.

CHAPTER 1 | INTRODUCTION

1.1 INTRODUCTION

18. Under the provisions of the Endangered Species Act (“the Act”), the U.S. Fish and Wildlife Service (Service) proposes to designate critical habitat for three plant species (*Bidens micrantha* ssp. *Ctenophylla*, *Isodendrion pyrifolium* and *Mezoneuron kawaiense*) on Hawaii Island (Big Island). The purpose of this report is to evaluate the potential economic impacts of the proposed critical habitat. The report was prepared by Industrial Economics, Incorporated (IEc) for the U.S. Fish and Wildlife Service (Service).
19. This information is intended to assist the Secretary of the U.S. Department of the Interior (DOI) in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation, unless such exclusion would result in the extinction of the species.²⁰ In addition, this information allows the Service to address the requirements of Executive Orders 12866 (as affirmed and supplemented by Executive Order 13563), 12630, and 13211; the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA); and the Unfunded Mandates Reform Act (UMRA).²¹

1.2 PROPOSED CRITICAL HABITAT DESIGNATION

20. On October 2, 2012, the Service published a Proposed Rule to list 15 species (13 plants, one insect, and one crustacean) on the Big Island as endangered and to designate critical habitat for three plant species under the Endangered Species Act (“Act”).²² One of the plant species, *Bidens micrantha* ssp. *Ctenophylla*, is concurrently being proposed for listing. The other two plant species (*Isodendrion pyrifolium* and *Mezoneuron kawaiense*) were previously listed as endangered but do not have designated critical habitat on the Big Island. Critical habitat was previously proposed for *Isodendrion pyrifolium* on the Big Island, but was excluded from the final designation under section 4(b)(2) of the Act.²³
21. The proposed critical habitat designation includes seven multi-species units, totaling 18,766 acres (7,597 hectares) within Hawaii’s lowland dry ecosystem.²⁴ The Proposed

²⁰ 16 U.S.C. §1533(b)(2).

²¹ Executive Order 12866, Regulatory Planning and Review, September 30, 1993; Executive Order 13563, Improving Regulation and Regulatory Review, January 18, 2011; Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights, March 15, 1988; Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001; 5. U.S.C. §§ 601 et seq; Pub Law No. 104-121; and 2 U.S.C. § 1501 et seq.

²² 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63928.

²³ 2003 Final Critical Habitat Rule, 68 FR 39624

²⁴ 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63928.

Rule describes each of the units as being occupied by one or more of the three plants. The plants do not necessarily occur across the entirety of each unit; portions of each occupied unit are not considered occupied by the relevant plant species.²⁵

22. In addition, the Proposed Rule identifies several areas as “under consideration for exclusion” from the final critical habitat designation under section 4(b)(2) of the Act. These areas include:

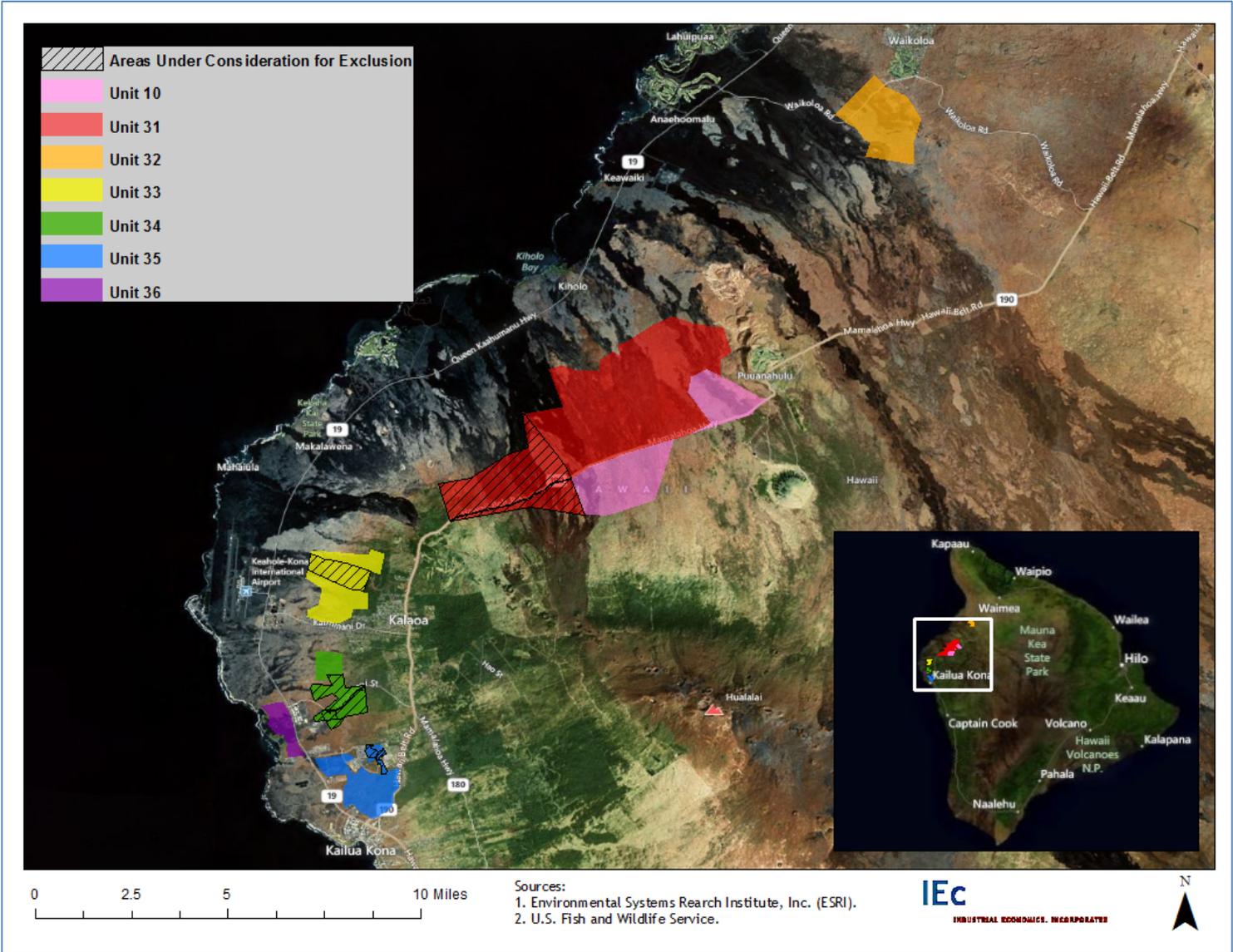
- Unit 31: 2,834 acres associated with Kamehameha Schools
- Unit 33: 502 acres associated with Palamanui Global Holdings, LLC
- Unit 34: 630 acres associated with the Kaloko Makai Development and 47 acres associated with Lanihau Properties; and
- Unit 35: 87 acres associated with the Department of Hawaiian Home Lands’ Villages of La’i’opua.

The proposed critical habitat and the areas under consideration for exclusion are identified in Exhibit 1-1.²⁶ Our analysis separately presents impacts in the areas being considered for exclusion from the remainder of the area proposed for designation.

²⁵ Personal communication from the Service on January 15, 2013.

²⁶ The 2003 Big Island critical habitat designation (68 FR 39624, Final Critical Habitat Rule) includes units numbered 1-30. The 2012 proposed designation includes Section 1 (which consists of a portion of existing plant critical habitat in Unit 10, and newly proposed critical habitat in Unit 31), as well as units 31-36.

EXHIBIT 1-1. OVERVIEW OF BIG ISLAND PROPOSED CRITICAL HABITAT



23. Exhibit 1-2 presents the approximate size of each of the proposed critical habitat units, as well as status of land ownership, as described in the Proposed Rule. Overall, approximately 64 percent of the proposed designation is owned by the State of Hawaii; approximately 34 percent is privately-owned; approximately two percent comprises Federal land managed by the National Park Service; and less than one percent is owned by the County of Hawaii.²⁷

EXHIBIT 1-2 SIZE OF PROPOSED CRITICAL HABITAT UNITS AND LAND OWNERSHIP (ACRES)

UNIT	STATE	FEDERAL	COUNTY	PRIVATE	TOTAL ¹
Unit 10 ²	2,914	0	0	0	2,914
Unit 31 ²	7,101	0	0	2,834	9,936
Unit 32	21	0	0	1,758	1,779
Unit 33	1,080	0	0	502	1,583
Unit 34	259	0	0	702	961
Unit 35	606	0	19	568	1,192
Unit 36	5	397	0	0	402
TOTAL¹	11,986	397	19	6,364	18,766
Notes: 1 - Estimates are rounded to the nearest whole acre. Entries may not sum to the totals presented due to rounding. 2 - The Proposed Rule describes Unit 10 and Unit 31 as part of "Section 1." Source: 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63983.					

1.3 ECONOMIC ACTIVITIES CONSIDERED IN THIS ANALYSIS

24. This analysis focuses on the economic activities that are occurring or have the potential to occur within the proposed critical habitat area and, according to the Service, are of primary concern with respect to potential adverse modification of critical habitat.²⁸ These activities are:

1. **Development:** Development (commercial, residential, industrial) is considered a threat to the physical or biological features essential to the conservation of the three plant species. In particular, in the increasingly urbanized region of north Kona, development threatens to degrade or destroy the lowland dry ecosystem where the plants occur.²⁹
2. **Transportation projects:** Transportation projects occurring within the proposed critical habitat include expansion of a new highway. This project also poses a threat to the critical habitat for the same reasons as development activities.³⁰

²⁷ 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63983.

²⁸ Personal communication with the Service on December 19, 2012.

²⁹ 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63983.

³⁰ Personal communication with the Service on December 19, 2012.

25. We did not identify any grazing or farming activities occurring or proposed within the area proposed for critical habitat designation. In addition, no renewable energy projects were identified as planned or proposed within proposed critical habitat.³¹ Our analysis therefore focuses on potential impacts to development and transportation projects. Within these activity categories, we focus our analysis on those projects that are considered reasonably likely to occur within the proposed critical habitat area. This includes projects or activities that are currently planned or proposed, or that permitting agencies or land managers indicate are likely to occur.

1.4 FRAMEWORK FOR THE ANALYSIS

26. This analysis evaluates the potential *incremental* impacts resulting from the designation of critical habitat. The U.S. Office of Management and Budget's (OMB) guidelines for best practices concerning the conduct of economic analysis of Federal regulations direct agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action."³² Significant debate has occurred regarding whether assessing the impacts of the Service's proposed regulations using this baseline approach is appropriate in the context of critical habitat designations.

27. In order to address these court opinions and provide the most complete information to decision-makers, this economic analysis will employ both "without critical habitat" and "with critical habitat" scenarios:

- The "**without critical habitat**" scenario represents the **baseline** for the analysis, considering protections already afforded the plants. The baseline for this analysis is the state of regulation, absent designation of critical habitat that provides protection to the species under the Act, as well as under other Federal, State and local laws and conservation plans. The baseline includes sections 7, 9, and 10 of the Act to the extent that they are expected to apply absent the designation of critical habitat for the species.
- The "**with critical habitat**" scenario describes and monetizes, where possible, the **incremental** impacts due specifically to 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.

28. Appendix B provides a more detailed discussion of the case law informing this approach, the types of economic impacts quantified, and the scope of the analysis.

29. The focus of the incremental analysis is to determine the impacts of the designation on land uses and activities above and beyond those impacts resulting from existing conservation efforts (either required or voluntary) expected to be undertaken within the area proposed for critical habitat designation. Agencies and individuals may, for example, be implementing conservation efforts that benefit the plants regardless of critical habitat

³¹ Personal communication with Hawaii State Energy Office on February 11, 2013.

³² OMB, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars_a004_a-4.

designation (e.g., due to other Federal, state, and local regulations or guidelines, including the listing of the species under the Act).

30. Absent critical habitat designation, section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. The portion of the administrative costs of consultations considering the jeopardy standard, along with the impacts of conservation efforts resulting from consideration of this standard, are baseline impacts.
31. The most challenging part of this analysis involves isolating the change in conservation recommendations the Service may make as a result of the designation of critical habitat. When critical habitat is designated, section 7 requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to considering whether the actions are likely to jeopardize the continued existence of the species). The added administrative costs of considering critical habitat in section 7 consultations, and the additional impacts of implementing conservation efforts resulting from the protection of critical habitat, are the direct compliance costs of designating critical habitat. These costs are not in the baseline and are considered incremental impacts of the rulemaking.
32. The Service is the best source of information concerning the types of conservation efforts it is likely to request during the section 7 consultation process. The Service describes its likely recommendations in a memorandum drafted to support this analysis, titled “Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Designate Critical Habitat for 3 Species on the Island of Hawaii.”³³ This memorandum is provided in Appendix E of this report.
33. Additionally, incremental impacts may include indirect impacts resulting from reaction to the potential designation of critical habitat, triggering of additional requirements under state or local laws intended to protect sensitive habitat, and uncertainty and perceptual effects on markets. In other words, the information provided by the critical habitat designation (i.e., highlighting areas on a map that may require additional protection) may influence state and local regulators or private entities. For example, state permitting agencies may request additional protective efforts prior to the issuance of permits on private lands designated as critical habitat even in the case that a project is not subject to section 7 consultation under the Act.
34. Such outcomes are unintended consequences of the regulation; however, these outcomes may result in real costs. To better understand the potential for such indirect effects, we conducted interviews with state and local government regulators and owners or managers of land proposed as critical habitat.
35. The direct and indirect costs of the regulation are represented by the opportunity cost to the regulated community of implementing conservation efforts for the plants. To estimate these costs, we use readily available data as well as information provided by stakeholders.

³³ US Fish and Wildlife Service to Industrial Economics, Inc. January 15, 2013. “Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Designate Critical Habitat for 3 Species on the Island of Hawaii.” See Appendix E.

Benefits are the positive gains in welfare (e.g., improved habitat to support recovery of the species) resulting from these behavioral changes. We describe the potential benefits of such action qualitatively in Chapter 2.

36. Finally, we consider the distribution of economic impacts. Specifically, the distributional analyses are focused on understanding the effects of the rule on certain sub-populations, such as small entities or state and local governments. Potential distributional effects are evaluated in Appendix A of this report.

Identifying Incremental Impacts of Critical Habitat for the Big Island Plants

37. To inform our understanding of the potential effects of the critical habitat designation for the plants, the Service provided guidance (Appendix E) describing how it intends to consider conservation recommendations for the plants in future section 7 consultations with critical habitat versus without critical habitat. The following summary distills the key findings of the Service’s memorandum that inform our economic analysis:

Direct Incremental Impacts in Occupied Habitat Areas

- The presence of the plants across the proposed designation provides extensive baseline protection. Where the plants are present, projects or activities with a Federal nexus would be subject to section 7 consultation regardless of critical habitat designation. The Service expects to recommend conservation efforts in section 7 consultation to avoid and minimize impacts to the species, including offsetting habitat loss (i.e. acquiring, restoring, and managing habitat, in perpetuity, to compensate for habitat disturbed).^{34,35} The recommendation to offset habitat disturbance would therefore most likely be made in occupied habitat regardless of critical habitat designation and critical habitat designation is unlikely to affect the offset ratio recommended (i.e., the ratio of conserved acres to disturbed acres).
- The Service states that the effect of critical habitat designation on the outcome of future consultations in occupied habitat may be the additional stipulation that the offsets be located within the critical habitat area, preferably within the affected unit.³⁶ However, the Service further notes that in order to minimize or avoid potential jeopardy, the conservation offsets would need to occur in areas that could support the species, specifically within the lowland dry ecosystem.³⁷ Because the proposed critical habitat area encompasses the lowland dry ecosystem that may support the plants, it is therefore most likely that the

³⁴ *Ibid.*

³⁵ Note that the exact nature of the Service’s recommendations would be determined during section 7 consultation and would depend on the specific nature of the proposed project.

³⁶ US Fish and Wildlife Service to Industrial Economics, Inc. January 15, 2013. “Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Designate Critical Habitat for 3 Species on the Island of Hawaii.” See Appendix E.

³⁷ Personal communication with the Service on February 26, 2013.

conservation offsets be located within the proposed critical habitat area even absent critical habitat designation.^{38,39}

- It is therefore unlikely that critical habitat designation will change the outcome of future section 7 consultations on projects or activities within occupied areas, and incremental impacts will most likely be limited to the additional administrative effort of considering adverse modification as part of consultation.

Direct Incremental Impacts in Unoccupied Habitat Areas

- In unoccupied areas, it is unlikely that projects or activities with a Federal nexus would be subject to section 7 consultation absent critical habitat designation. In this case, all costs associated with conservation efforts for the relevant plant species that are recommended in section 7 consultation, as well as the administrative costs of section 7 consultation, are direct incremental costs of the critical habitat designation.
- For the projects identified as occurring within unoccupied areas, the Service suggested it may recommend that 50 to 150 acres of land be set aside, as well as restored (if necessary) and managed, in perpetuity.^{40,41} According to the Service, the offsetting could include a combination of onsite areas (on the portion of the project sites overlapping proposed critical habitat) and offsite areas elsewhere within the proposed critical habitat.⁴²

38. As the projects and activities occurring within occupied habitat areas are less likely to be directly affected by the critical habitat designation (i.e., impacts are most likely limited to administrative costs), our analysis focuses on projects occurring in areas where the three plant species are not present. Chapter 2 of this report evaluates projects proposed in unoccupied areas proposed for critical habitat designation. For all projects, regardless of whether they overlap occupied or unoccupied areas, we describe the potential indirect effects of the designation.

Benefits

39. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.⁴³ Chapter 2 of this analysis includes a qualitative discussion of the potential benefits of the Proposed Rule.

³⁸ *ibid.*

³⁹ 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63981.

⁴⁰ Note that the exact nature of the Service's recommendations would be determined during section 7 consultation and would depend on the specific nature of the proposed project.

⁴¹ Personal communication with the Service on February 13, 2013.

⁴² Personal communication with the Service on February 26, 2013.

⁴³ OMB, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars_a004_a-4.

Information Sources

40. The primary sources of information for this report are communications with, and data provided by, personnel from the Service, state and local government agencies, private landowners, and other stakeholders. Specifically, we referenced publicly available information, including public comments submitted on the Proposed Rule, and agency planning documents (e.g., development plans). A complete list of references is provided at the end of the main text of this document.

1.5 STRUCTURE OF THE REPORT

41. This report is organized into two chapters. Chapter 1 provides background on the proposed critical habitat rule as well as an overview of the framework of the analysis. Chapter 2 provides the analysis of potential incremental economic impacts of critical habitat designation. This report also includes five appendices: Appendix A addresses additional statutory requirements for this analysis in accordance with relevant executive orders and regulations; Appendix B provides a detailed discussion of the framework of the analysis; Appendix C describes the sensitivity of results to discount rates; Appendix D presents undiscounted impacts; and Appendix E provides the Service's memorandum to IEC describing potential changes in conservation recommendations for these species due to critical habitat designation.

CHAPTER 2 | ECONOMIC IMPACTS OF CRITICAL HABITAT DESIGNATION

42. This chapter assesses the potential impacts of proposed critical habitat designation on development and transportation projects identified as reasonably likely to occur within the areas proposed for critical habitat designation. As described in the Proposed Rule, development and urbanization of lowland dry ecosystem on the Big Island may result in adverse effects to the plants or their critical habitat.⁴⁴ The Service also identified transportation activities as potential threats to the species and their critical habitat.⁴⁵
43. The evaluation of the potential impacts of critical habitat designation applies the following method:
1. Identify currently planned development and transportation projects reasonably likely to occur within the proposed critical habitat area;
 2. Identify which projects are located on lands that are unoccupied by the plants, as these projects are likely to experience relatively greater impacts compared with projects occurring in occupied areas, as described in Chapter 1;
 3. For projects in unoccupied habitat, determine the nature of conservation efforts the Service expects to recommend, as well as any indirect effects of the designation on the cost, scope, or scale of the proposed projects;
 4. Evaluate and, where possible, quantify:
 - a. Incremental administrative costs of consultation on the identified projects (occupied and unoccupied habitat);
 - b. Incremental conservation efforts recommended by the Service for projects located in unoccupied areas of the proposed designation; and
 - c. Indirect impacts of the designation.

⁴⁴ 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63983

⁴⁵ Personal communication with the Service on December 19, 2012.

2.1 SUMMARY OF RESULTS

44. Exhibit 2-1 presents the total estimated incremental impacts of the proposed critical habitat designation as described in this analysis. The key findings that led to the quantitative results are summarized in the following text box. Importantly, we emphasize that not all potential economic impacts are quantified in this analysis. Information limitations regarding the specific conservation measures that may be implemented due to critical habitat designation prevented a comprehensive accounting of economic impacts for particular projects. Where impacts could not be reliably quantified, this analysis describes the nature of the proposed projects and how they may be affected by the designation. Column four of Exhibit 2-1 indicates the units in which additional incremental impacts are reasonably likely to occur but are not quantified in the analysis.

EXHIBIT 2-1. INCREMENTAL IMPACTS OF CRITICAL HABITAT (2013-2022, 2013 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE IMPACTS (2013-2022)	ANNUALIZED IMPACTS	UNQUANTIFIED IMPACTS ²
AREAS PROPOSED FOR CRITICAL HABITAT DESIGNATION			
Unit 10	\$0	\$0	
Unit 31	\$0	\$0	
Unit 32	\$0	\$0	X
Unit 33	\$20,000	\$2,700	X
Unit 34	\$5,000	\$670	X
Unit 35	\$10,000	\$1,300	X
Unit 36	\$0	\$0	
Total Proposed for Designation	\$35,000	\$4,700	
AREAS BEING CONSIDERED FOR EXCLUSION			
Unit 10	\$0	\$0	
Unit 31	\$0	\$0	
Unit 32	\$0	\$0	
Unit 33	\$5,000	\$670	X
Unit 34	\$5,000	\$670	X
Unit 35	\$5,000	\$670	X
Unit 36	\$0	\$0	
Total Being Considered for Exclusion	\$15,000	\$2,000	
Notes: 1. The level of effort per consultation and the potential costs of project modifications represent approximate averages based on the best available cost information, as described in Exhibit B-1 of Appendix B. The cost estimates in this report are accordingly rounded to two significant digits to reflect this imprecision. The cost estimates may therefore not sum to the total costs reported due to rounding. 2. Unquantified impacts are discussed in section 2.6 of the report.			

KEY FINDINGS

Quantified Impacts

- For areas proposed for critical habitat designation, we estimate a total present value impact of \$35,000 over the next ten years (an annualized impact of \$4,700, seven percent discount rate) associated with future section 7 consultations. Impacts on projects occurring in areas being considered for exclusion are expected to be \$15,000 (an annualized impact of \$2,000, seven percent discount rate). These costs reflect administrative effort of considering critical habitat in future section 7 consultations on projects identified as occurring within the proposed critical habitat area.
- Specifically, we forecast five future section 7 consultations for projects located in areas overlapping proposed critical habitat Units 33, 34, and 35, and three future consultations for projects located in areas being considered for exclusion in proposed critical habitat units 33, 34, and 35. We assume that all of the consultations will occur in 2013, following the designation of critical habitat.

Unquantified Impacts

- This analysis concludes that additional direct and indirect impacts of the designation are likely, although information limitations preclude quantification in this analysis. In particular, two projects planned to occur in unoccupied habitat areas are likely to be subjects to economic impacts due to the designation.
- A Department of Hawaiian Home Lands project on 91 acres of an unoccupied area of proposed critical habitat Unit 33 is likely to be subject to section 7 consultation. However, significant uncertainty exists regarding the extent of conservation efforts that the Department will ultimately undertake to avoid adverse modification of critical habitat. While the Service has indicated that they may recommend that the Department set aside, restore (if necessary), and manage, in perpetuity, 50 to 150 acres within critical habitat, the Department anticipates this level of conservation offset would be infeasible. The Service and Department are planning to meet to discuss the proposed development and how to avoid adverse modification of critical habitat. As of the writing of this analysis, the outcome of this meeting is uncertain.
- A Queen Lili`uokalani Trust project overlaps 302 unoccupied acres in proposed critical habitat Unit 35. While a Federal nexus compelling consultation is unlikely, the project may be subject to indirect impacts including additional management by the county associated with required zoning changes. While it is uncertain what conservation efforts the county may require as a result of the critical habitat designation, the Trust emphasizes its fiduciary responsibilities to its beneficiaries (orphaned and destitute Native Hawaiian children and their families) and the positive social, cultural, and economic aspects of its development, as planned.

Key Uncertainties

- A significant uncertainty with respect to this analysis is the likelihood that critical habitat designation will generate indirect economic impacts, such as changes in land management by the state or county.
- While this analysis describes the Service's expectations regarding the most likely outcome of future section 7 consultations, the projects will be reviewed on a case by case basis during the consultation process and the ultimate nature and extent of conservation efforts is therefore subject to uncertainty.

2.2 OVERVIEW OF DEVELOPMENT ACTIVITY WITHIN PROPOSED CRITICAL HABITAT

45. The proposed critical habitat is located in the South Kohala and North Kona districts of the Big Island. The Hawaii County General Plan, approved in 2005 by the County Council, identifies both districts as the major tourism centers on the island, and describes Kona as “the center for government, commercial, and industrial activities for West Hawaii.”⁴⁶ The plan outlines a proposed land use pattern, known as the Land Use Pattern Allocation Guide (LUPAG), which identifies much of the proposed critical habitat area for “urban expansion,” where “new settlements may be desirable, but where the specific settlement pattern and mix of uses have not yet been determined.”⁴⁷
46. In addition to the General Plan, which serves as the overall planning document for the county, Hawaii County also has Community Development Plans that translate the broader goals of the General Plan into specific implementation actions for geographic regions around the island.⁴⁸ The Kona Community Development Plan (KCDP), adopted as Ordinance 08-131 in September 2008, identifies much of the area proposed for critical habitat designation as within the Kona Urban Area.⁴⁹ Specifically, the entirety of proposed critical habitat Units 34, 35, and 36, and the majority of Unit 33, fall within the Kona Urban Area, as shown in Exhibit 2-2.⁵⁰ One of the main goals of the KCDP is to direct future growth to the Kona Urban Area, and specifically to “compact villages located along proposed transit routes or to infill areas within, or adjacent to, existing development,” several of which overlap with the proposed critical habitat area.⁵¹

⁴⁶ County of Hawaii, General Plan, February 2005. Available at <http://www.cohplanningdept.com/community-planning/general-plan/>, accessed on February 26, 2013.

⁴⁷ *Ibid.*

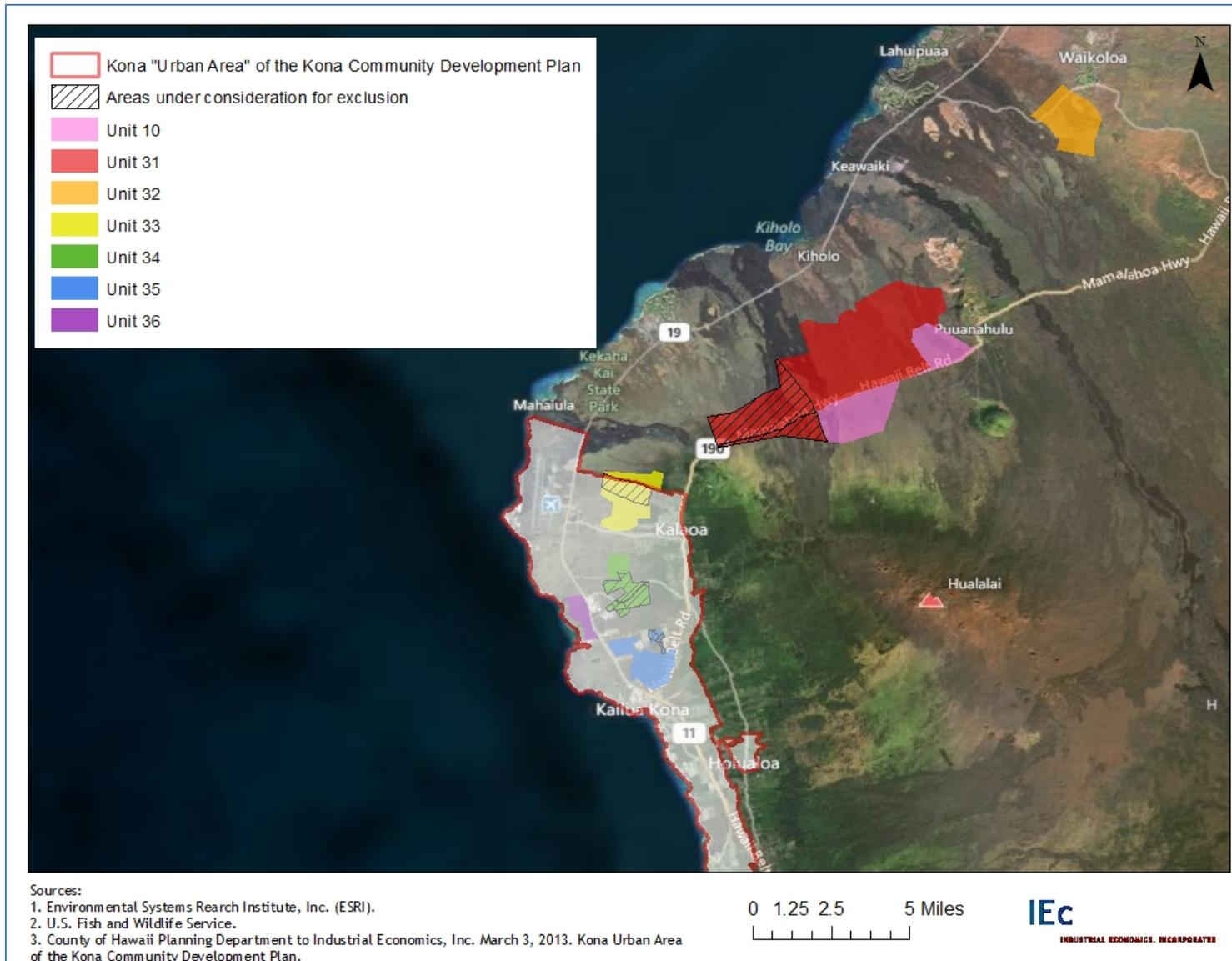
⁴⁸ County of Hawaii, Planning Department. 2013. *Community Development Plans*. Available at <http://www.hawaiicountycdp.info/about-cdps>, accessed on March 1, 2013.

⁴⁹ County of Hawaii, State of Hawaii, Ordinance 08-131, Kona Community Development Plan, 2008.

⁵⁰ *Ibid.*

⁵¹ *Ibid.*

EXHIBIT 2-2. PROPOSED CRITICAL HABITAT AREA AND KONA COMMUNITY DEVELOPMENT PLAN'S "KONA URBAN AREA"



47. A number of recently completed projects in the area are expected to stimulate further development and accommodate the growth outlined in the KCDP. Of note, the recent completion of the first three phases of the new Ane Keohokalole Highway, which runs parallel to the Queen Kaahumanu Highway from Palani Road to Hina Lani Street, provides key infrastructure needed to facilitate the transit-oriented development envisioned in the KCDP.⁵² In addition, a number of development projects have occurred in the area over the past decade, including expansion of the Makalapua Business Center and the Kona Commons retail area.⁵³

2.3 IDENTIFICATION OF PROJECTS WITHIN PROPOSED CRITICAL HABITAT

48. In order to identify specific projects that are reasonably likely to occur within the proposed critical habitat areas, we contacted the County of Hawaii's Planning Department, reviewed county and local planning documents, and reviewed public comments that were submitted in response to the Proposed Rule. Exhibit 2-3 identifies the tax map key (TMK) parcels containing the development projects identified, as well as the approximate location for the planned Phase III of the Ane Keohokalole Highway project, which will run from Hina Lani Street to Kaiminani Drive.⁵⁴ According to the county, other phases of the highway project have been completed, including the portion from Kaiminani Drive to Palamanui.⁵⁵

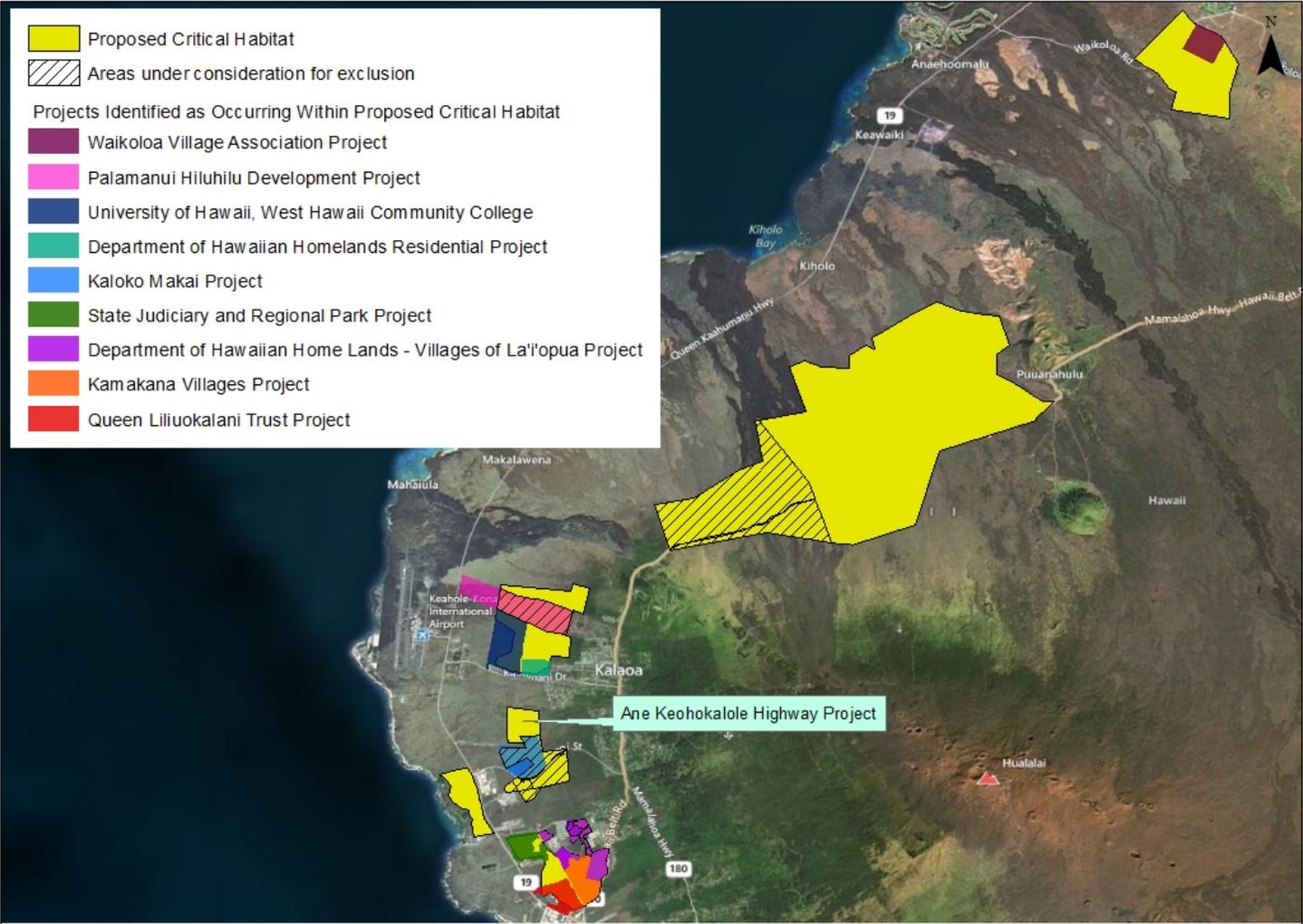
⁵² Personal communication with the Planning Department Head, County of Hawaii Planning Department, on February 28, 2013.

⁵³ Queen Liliuokalani Trust to Industrial Economics, Inc. February 23, 2013. "Socio Economic Impact of Critical Habitat Designation for the Keahuolu Lands of the Queen Liliuokalani Trust." Prepared by John M. Knox & Associates, Inc. with assistance from Dinell Associates, LLC.

⁵⁴ Personal communication with the Planning Department Head, County of Hawaii Planning Department, on February 28, 2013.

⁵⁵ *Ibid.*

EXHIBIT 2-3. OVERVIEW OF PROJECTS IDENTIFIED WITHIN BIG ISLAND PROPOSED CRITICAL HABITAT



0 1.25 2.5 5 Miles

Sources:
 1. Environmental Systems Research Institute, Inc. (ESRI).
 2. U.S. Fish and Wildlife Service.
 3. State of Hawaii, Office of Planning, GIS Program. Tax Map Key (TMK) Parcels, updated May 8, 2012.



49. Exhibit 2-4 provides information regarding the occupancy status for each of the identified projects, as well as the proposed critical habitat units overlapping each project.

EXHIBIT 2-4. OCCUPANCY STATUS OF TMK PARCELS CONTAINING IDENTIFIED FUTURE PROJECTS

PROJECT	PROPOSED CRITICAL HABITAT UNIT	OCCUPIED	UNOCCUPIED
Waikoloa Village Association	Unit 32	X ¹	
Palamanui Hiluhilu Development	Unit 33 ³	X	
University of Hawaii, West Hawaii Community College	Unit 33	X ²	
Department of Hawaiian Home Lands Residential Project	Unit 33		X
Kaloko Makai Project	Unit 34 ³	X	
Ane Keohokalole Highway Project	Unit 34	X	
State Judiciary and Regional Park Project	Unit 35	X	
Department of Hawaiian Home Lands - Villages of La'i'opua Project	Unit 35 ³	X	
Kamakana Villages Project	Unit 35	X	
Queen Lili'uokalani Trust Project	Unit 35		X
<p>Source: The Service identified whether it considers the location of each project to be an area that currently supports one or more of the three Big Island plants subject to proposed critical habitat (Personal communication with the Service on February 11, 2013).</p> <p>Notes: 1. While the Service identified this parcel as occupied by one of the three Big Island plants, subsequent communication with the landowner revealed that 15 acres of the approximately 267-acre parcel overlapping proposed critical habitat Unit 32 are no longer occupied due to excavation and grading work that has already been completed for a light-industrial project (Personal communication with Waikoloa Village Association on February 21, 2013). 2. This parcel is unoccupied by the three Big Island plants subject to the critical habitat rule, but is occupied by another federally listed, endangered plant, <i>Nothocestrum breviflorum</i> (Personal communication with the Service on March 4, 2013). 3. The Palamanui and Kaloko Makai development projects are located within areas of the proposed critical habitat designation that are being considered for exclusion. Part of the Villages of La'i'opua project in proposed critical habitat Unit 35 is located in an area being considered for exclusion.</p>			

50. As identified in Exhibit 2-4, of the projects we identified within areas proposed for critical habitat designation, only two are expected to occur on lands that are unoccupied by the species: the Department of Hawaiian Home Lands' ("Department") residential project in proposed critical habitat Unit 33, and the Queen Lili'uokalani Trust ("Trust") project in proposed critical habitat Unit 35. We focus our incremental analysis of the potential effects of critical habitat designation on these two projects because incremental impacts on projects occurring in the occupied areas are unlikely to be directly affected by

the designation beyond potential additional administrative effort. For all projects (regardless of whether they overlap occupied or unoccupied habitat), we discuss the potential for indirect impacts generated by the designation in section 2.6 of this chapter.

51. Note that, as indicated in Exhibit 2-4, an area of the parcel owned by the Waikoloa Village Association (WVA) that overlaps with proposed critical habitat Unit 32 is unoccupied due to recent excavation and grading work that has already been completed for a light-industrial project.⁵⁶ The project, according to WVA, is expected to generate approximately \$2.8 million in rent over the next 65 years, and the Association has invested a substantial amount into infrastructure (roadways, water and sewer lines, etc.) to support the development.⁵⁷ However, according to WVA, a Federal nexus for the project that would lead to section 7 consultation is unlikely.⁵⁸ Therefore, incremental impacts of the designation on this project are likely to be limited to indirect impacts; as discussed in Section 2.6.
52. In addition, the University of Hawaii's West Hawaii Community College project is located in an area that, while unoccupied by the three plant species subject to proposed critical habitat, is occupied by the federally-listed, endangered plant, *Nothocestrum breviflorum*.⁵⁹ According to the Service, if a Federal nexus exists for this project, it may recommend that loss of the plant and its surrounding habitat be offset by the establishment of 100 mature individuals in protected sites totaling 50 to 150 acres in size.⁶⁰ This recommendation is similar to what the Service expects to suggest in order to offset impacts to critical habitat (as described in Chapter 1). That is, the conservation recommended to avoid effects on the listed plant that is present at this site would likely also result in the project avoiding potential adverse modification of critical habitat. Therefore, although the area is not occupied by the three plants with proposed critical habitat, the incremental impacts of critical habitat to this project are likely to be limited to additional administrative effort in section 7 consultation.

2.4 PROJECTS OCCURRING IN UNOCCUPIED AREAS OF PROPOSED CRITICAL HABITAT

53. As described in Chapter 1, projects expected to occur in unoccupied habitat areas are more likely to be measurably affected by the critical habitat designation. Any conservation recommendations made by the Service through section 7 consultation on these projects would be due to the presence of critical habitat and therefore considered direct impacts critical habitat designation. In addition, any changes in the management of these project areas by the state or county would be due to the presence of critical habitat and not the plants themselves, and would be accordingly be considered indirect impacts of the designation (i.e., not expected to be incurred absent the designation). As noted

⁵⁶ Personal communication with Waikoloa Village Association on February 21, 2013.

⁵⁷ Personal communication with Waikoloa Village Association on March 6, 2013.

⁵⁸ *Ibid.*

⁵⁹ Personal communication with the Service on March 4, 2013.

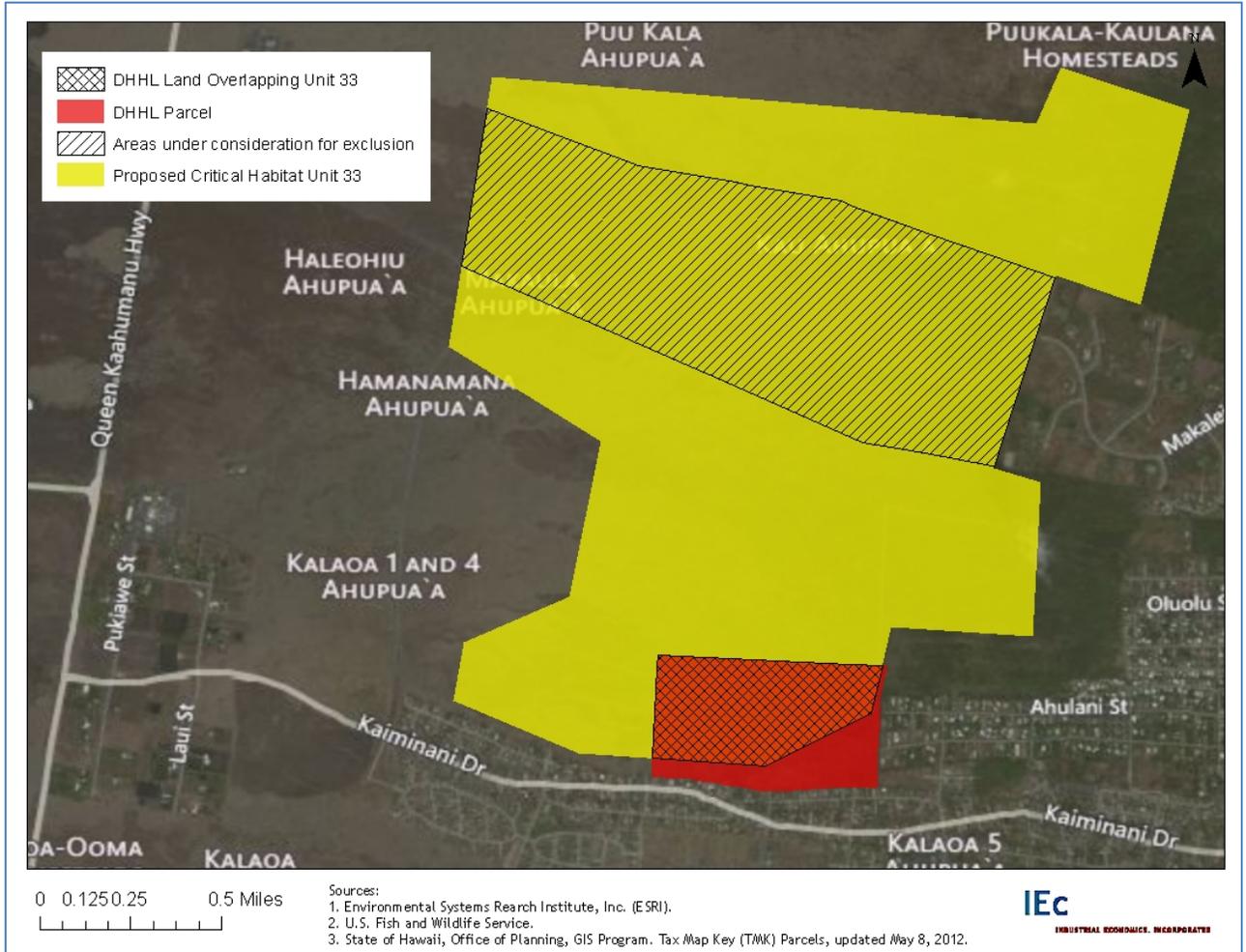
⁶⁰ *Ibid.*

above, we identified two proposed projects in unoccupied areas proposed for critical habitat designation.

Department of Hawaiian Home Lands Project

54. The Department owns a parcel of land that overlaps with proposed critical habitat Unit 33. According to the Service, the parcel is currently unoccupied by the plant *Mezoneuron kavaïense* but is essential for the conservation of the species.⁶¹ Exhibit 2-5 identifies this parcel and the area that overlaps with proposed critical habitat.

EXHIBIT 2-5. DEPARTMENT OF HAWAIIAN HOME LANDS PROJECT LOCATION



55. The Department’s parcel identified in Exhibit 2-5 is approximately 130 acres, 91 of which overlap with proposed critical habitat Unit 33. According to the Department, the entire 91 acres are slated for future homestead residential development.⁶² While no specific development plans are available at this time, the Department tentatively plans for approximately 400 residential homestead units on the area overlapping proposed critical

⁶¹ Personal communication with the Service on February 11, 2013.

⁶² Personal communication with Department of Hawaiian Home Lands on February 25, 2013.

57. The Trust is a Private Operating Foundation under section 501(c)(3) of the Internal Revenue Code (IRC) that raises revenues from lands bestowed by Queen Lili'uokalani, Hawaii's last reigning monarch, to benefit Native Hawaiian orphans and destitute children.⁶⁷ In other words, the Trust provides social services to serve the needs of the Native Hawaiian community. The Trust indicates that the parcels of land highlighted in Exhibit 2-6 that overlap with proposed critical habitat are the most valuable of the Trust's portfolio of undeveloped landholdings and are expected to be the primary future source of revenue for expansion of the Trust's programs for Native Hawaiian children and their families.⁶⁸ Planning for the development of these parcels has been underway for more than 30 years, and significant initial investments (totaling approximately \$40 million) have been made in initial infrastructure (water supply, interior roadways, etc.) and permit requirements in preparation for the development.⁶⁹
58. In response to recent changes in market conditions and the new KCDP, the Trust is currently developing a new Master Plan for the site that will include residential, retail, and office mixed-use, as well as amenities and public services, including parks, a recreation center, and a school.⁷⁰ The Trust estimates that the commercial portions of the project, if operational today, would generate approximately \$12.4 million a year in revenues, and the projected proceeds from the sale of residential lands would generate \$71.4 million.⁷¹ In addition to generating significant revenue for the Trust, the project, once built, is expected to support approximately 2,860 jobs.⁷²
59. Importantly, the project is a central part of the KCDP and is identified as both within the Kona Urban Area and as part of a future Neighborhood Transit-Oriented Development (TOD).⁷³ In addition, the parcels fall within the General Plan LUPAG's Urban Expansion and High Density Urban Areas, and the State's Urban Land Use District.^{74,75} The Trust has planned the development to be consistent with long-term public policy outlined by the county in its General Plan and KCDP, as well as national policy on sustainable development, as outlined by the U.S. Department of Housing and Urban Development's (HUD) Office of Sustainable Housing and Communities.⁷⁶ Specifically, in addition to

⁶⁷ Queen Liliuokalani Trust to Industrial Economics, Inc. February 23, 2013. "Socio Economic Impact of Critical Habitat Designation for the Keahuolu Lands of the Queen Liliuokalani Trust." Prepared by John M. Knox & Associates, Inc. with assistance from Dinell Associates, LLC.

⁶⁸ *Ibid.*

⁶⁹ *Ibid.*

⁷⁰ *Ibid.*

⁷¹ *Ibid.*

⁷² *Ibid.*

⁷³ County of Hawaii, State of Hawaii, Ordinance 08-131, Kona Community Development Plan, 2008.

⁷⁴ County of Hawaii, General Plan, February 2005. Available at <http://www.cohplanningdept.com/community-planning/general-plan/>, accessed on February 26, 2013.

⁷⁵ State of Hawaii, Office of Planning, State GIS Program. State Land Use Districts, Updated February 25, 2013. Available at <http://www.state.hi.us/dbedt/gis/slud.htm>, accessed on March 3, 2013.

⁷⁶ Queen Liliuokalani Trust to Industrial Economics, Inc. February 23, 2013. "Socio Economic Impact of Critical Habitat Designation for the Keahuolu Lands of the Queen Liliuokalani Trust." Prepared by John M. Knox & Associates, Inc. with assistance from Dinell Associates, LLC.

raising revenue for orphaned and destitute Native Hawaiian children and their families, the project is designed to benefit the broader community by improving access to jobs, reducing transportation costs, creating walkable neighborhoods, expanding housing choices, and preserving open space.⁷⁷

2.5 UNQUANTIFIED DIRECT IMPACTS OF THE PROPOSED CRITICAL HABITAT DESIGNATION

60. Of the two projects discussed in section 2.4, only the Department's project is likely to have a Federal nexus that would lead to section 7 consultation with the Service in the case that critical habitat is designated in this area.⁷⁸ The Department is likely to use Federal funding from HUD. The Trust's project is unlikely to involve the use of Federal funding or require Federal permitting, and therefore direct impacts on this project (those associated with section 7 consultation) are unlikely; indirect impacts on this project are discussed further in section 2.6 of this chapter.⁷⁹ We therefore focus our incremental analysis of direct impacts of critical habitat designation on the Department's project overlapping proposed critical habitat Unit 33.
61. The Service has indicated that it may recommend that development projects offset habitat loss (i.e. acquire, restore, and manage habitat, in perpetuity, to compensate for habitat disturbed as a result of a project or activity). For the potential future development on the Department's parcel, the Service suggested it may recommend that this offset encompass 50 to 150 acres of land.⁸⁰ According to the Service, the offsetting could include a combination of onsite areas (within the Department's parcels overlapping proposed critical habitat Unit 33) and offsite areas elsewhere within the proposed critical habitat.⁸¹ It is important to note that this is a potential recommendation that may be made in section 7 consultation, and the final recommendation would depend on the specific nature of the project.⁸²
62. According to the Department, setting aside 50 to 150 acres within the 91 acre area overlapping proposed critical habitat Unit 33 would jeopardize their plans for developing 400 residential homestead units and detract from their overall mission, which is to manage the Hawaiian Home Lands Trust to benefit Native Hawaiians.⁸³ Furthermore, according to the Department, it would not be possible to establish such an offset on the Department's lands elsewhere within critical habitat, as their lands overlapping proposed

⁷⁷ *Ibid.*

⁷⁸ Personal communication with Department of Hawaiian Home Lands on February 25, 2013.

⁷⁹ Personal communication with the Queen Liliuokalani Trust on February 28, 2013.

⁸⁰ Personal communication with the Service on February 13, 2013.

⁸¹ Personal communication with the Service on February 26, 2013.

⁸² The Service may recommend conservation measures as part of section 7 consultation on a project or activity. Unless the Service has determined that, absent these conservation measures, the project or activity is likely to jeopardize the species or result in adverse modification of critical habitat, implementation of the conservation recommendations is at the discretion of the Federal Action Agency.

⁸³ Personal communication with Department of Hawaiian Home Lands on March 5, 2013.

critical habitat Unit 35 are already slated for development as part of the Hawaii Housing Finance and Development Corporation's Villages of La'opua Master Plan.⁸⁴ Significant initial investments (totaling approximately \$40 million) have already been made on this project, which is planned to include affordable housing and community facilities (such as a park, village center, community center).^{85,86} The Department has commented that setting aside portions of these lands for conservation would divert resources away from its core purpose of rehabilitating Native Hawaiians through their homesteading program, and that obtaining approval from the Hawaiian Homes Commission for purchasing conservation land elsewhere would be very difficult.^{87,88}

63. The Department also anticipates that identifying a willing seller to allow for purchase of lands within the critical habitat area to offset its development plans would be difficult.⁸⁹ Our analysis indicates that, of the approximately 18,766 acres of proposed critical habitat, approximately 66 percent are owned by government entities, and approximately 17 percent are owned by private charitable trust organizations (Queen Lili'uokalani Trust and Kamehameha Schools).⁹⁰ The remaining 17 percent (approximately 3,230 acres) is owned by private entities, many of which have current development plans for their lands, as identified in Exhibit 2-3. Therefore, the Department anticipates that it would be difficult to find a willing seller of land elsewhere in critical habitat at an economically feasible price.
64. The Department plans to communicate further with the Service to identify reasonable and prudent alternative conservation effort options, for example through a collaborative partnership effort.⁹¹ Because the outcome of these discussions is uncertain, this analysis does not quantify the potential direct impacts of conservation efforts implemented as a result of section 7 consultation on this project. We highlight, however, that this project is expected to be directly affected by the critical habitat designation.

2.6 UNQUANTIFIED INDIRECT EFFECTS OF THE PROPOSED CRITICAL HABITAT DESIGNATION

65. This section describes the potential indirect effects of the proposed critical habitat designation. Significant uncertainty regarding the likelihood, scope, and scale of these impacts limits our ability to monetize the economic costs. This analysis, however,

⁸⁴ Personal communication with Department of Hawaiian Home Lands on February 27, 2013.

⁸⁵ *Ibid.*

⁸⁶ Personal communication with Department of Hawaiian Home Lands on March 12, 2013.

⁸⁷ *Ibid.*

⁸⁸ Note that the Department's lands overlapping with proposed critical habitat Unit 35 are occupied by the plant species, according to the Service, and therefore the Service is likely to recommend conservation offsets for development projects occurring on these lands, regardless of the designation of critical habitat.

⁸⁹ *Ibid.*

⁹⁰ State of Hawaii, Office of Planning, State GIS Program. Tax Map Key (TMK) Parcels, updated May 8, 2012. Available at <http://hawaii.gov/dbedt/gis/download.htm>, accessed on March 1, 2013.

⁹¹ Personal communication with Department of Hawaiian Home Lands on February 25, 2013.

provides a qualitative characterization of these categories of impact to be considered alongside the quantified impacts in this analysis.

66. Landowners have expressed concern that the proposed critical habitat designation may result in the state or county limiting development on areas overlapping critical habitat, particularly through changes to the State Land Use Districts (redistricting lands to Conservation District) or county zoning classifications.^{92,93,94} In addition, there is concern that the state or county may request additional conservation efforts on lands designated as critical habitat before projects are approved.⁹⁵
67. According to the Department of Land and Natural Resources' (DLNR) Office of Conservation and Coastal Lands, which is responsible for overseeing lands within the State Land Use Conservation District, the presence of critical habitat does not necessarily generate re-districting of lands (e.g., redistricting from development use to conservation).⁹⁶ The State Office of Planning indicates that critical habitat is taken into consideration during the redistricting process (both during 5-year boundary reviews and when landowners, counties, or the state petition for boundary amendments); however, the presence of critical habitat does not necessarily mean that an area will be redistricted to the Conservation District.⁹⁷ For example, during the last 5-year boundary review in 1992, the Office of Planning proposed that certain streams that were identified as outstanding aquatic resources and water bird recovery habitat be reclassified to the Conservation District. However, the Land Use Commission only reclassified one stream to the Conservation District.⁹⁸ The state representatives were not able to identify an instance in which lands were petitioned to be, or were, re-districted specifically because of the presence of critical habitat.
68. According to the County of Hawaii's Planning Department, if a landowner applies for a change in zoning from the Open or Agricultural District to a district that is more appropriate for development, the presence of critical habitat would factor into the county's decision-making process and may result in the county requesting certain conservation efforts or an environmental assessment of the lands.⁹⁹ However, the county stated that the presence of listed species on such lands is the more important factor in the decision-making process.¹⁰⁰ The county was unable to identify an instance where critical habitat in particular resulted in additional conservation recommendations or a request for

⁹² Personal communication with Waikoloa Village Association on February 21, 2013.

⁹³ Public comment submitted by Waikoloa Dry Forest Initiative on December 17, 2012.

⁹⁴ Public comment submitted by Carlsmith Ball LLP on behalf of Forest City Hawaii Kona, LLC on December 17, 2012.

⁹⁵ *Ibid.*

⁹⁶ Personal communication with Office of Conservation and Coastal Lands on September 19, 2012.

⁹⁷ Personal communication with the State Office of Planning on November 9, 2012.

⁹⁸ Personal communication with the State Office of Planning on November 20, 2012.

⁹⁹ Personal communication with Planning Department Head, County of Hawaii Planning Department, on February 28, 2013.

¹⁰⁰ *Ibid.*

an environmental assessment. The county did, however, identify situations in which the presence of listed species resulted in conservation requirements including:

- Setting aside land for conservation;
- Establishing buffer zones around individual species;
- Requiring that landscaping be done using native plant species; and
- Relocating roadways or buildings to avoid species.¹⁰¹

69. Whether or not the County would make these recommendations for a particular project is highly dependent on the nature of the project and therefore cannot be predicted prior to the application for a zoning change.¹⁰² Should additional measures be required as a result of critical habitat, the associated costs would be considered indirect costs of the designation.
70. Based on communication with the county, we anticipate that critical habitat in particular is unlikely to result in changes in county zoning decisions and conservation recommendations for projects occurring *in occupied habitat* (as identified in Exhibit 2-4). With respect to the two projects identified as overlapping unoccupied habitat, the Department lands are exempted from county zoning regulations.¹⁰³ Consequently, the Trust's project located in unoccupied habitat in Unit 35 is most likely to experience indirect impacts as a result of the effects of critical habitat on county zoning review.

Queen Lili'uokalani Trust Project

71. While the Trust's planned project overlapping proposed critical habitat Unit 35 falls within the State Land Use Urban District, the current county zoning for the parcels includes Open, Agricultural-5A, and General Commercial Districts.¹⁰⁴ As a result, both the county and the Trust anticipate the need for future zoning changes in order for the development to move forward.^{105,106} As described above, the county may impose additional conservation efforts due to the presence of critical habitat; however, uncertainty exists regarding what these requirements may be.
72. The Trust has indicated a willingness to work cooperatively with the Service on a conservation plan and discussions between the Trust and the Service are currently underway.¹⁰⁷ While no agreement has yet been reached, the Service suggests that a set aside and management in perpetuity of 50 to 150 acres within the proposed critical habitat

¹⁰¹ Personal communication with Planning Department Head, County of Hawaii Planning Department, on March 5, 2013.

¹⁰² *Ibid.*

¹⁰³ Personal communication with Planning Department Head, County of Hawaii Planning Department, on February 28, 2013.

¹⁰⁴ State of Hawaii, Office of Planning, State GIS Program. County of Hawaii Zoning. Available at <http://hawaii.gov/dbedt/gis/hawctyzoning.htm>, accessed on March 3, 2013.

¹⁰⁵ Queen Liliuokalani Trust to Industrial Economics, Inc. February 23, 2013. "Socio Economic Impact of Critical Habitat Designation for the Keahuolu Lands of the Queen Liliuokalani Trust." Prepared by John M. Knox & Associates, Inc. with assistance from Dinell Associates, LLC.

¹⁰⁶ Personal communication with Planning Department Head, County of Hawaii Planning Department, on February 28, 2013.

¹⁰⁷ Personal communication with the Queen Liliuokalani Trust on February 28, 2013.

would likely avoid adverse impacts on the species' habitat (although consultation on this project is not expected).¹⁰⁸ The Trust anticipates that setting aside and managing a conservation offset of this size would be difficult for similar reasons as those identified by the Department. Specifically, with respect to purchase of land for set aside:

- The remaining critical habitat area is largely owned by government entities or private charitable trust organizations (as described above), limiting the Trust's ability to economically purchase 50 to 150 acres.
- In the case that the Trust is able to acquire a conservation offset area of 50 to 150 acres, it expects ongoing management of the area would be prohibitively expensive.¹⁰⁹
- Diverting funds for purchase and/or management of conservation offset lands would inhibit the Trust's ability to continue its ongoing land stewardship efforts, including invasive species management.¹¹⁰
- The Trust stated that as a Section 501(c)(3) tax-exempt private operating foundation, it must distribute at least 85 percent of the lesser value of its adjusted income or minimum investment return for the intended purpose of the Trust, and that purchasing land or setting aside a portion of its lands would constitute a "delay in benefit to charity" under Section 4942 of the IRC.¹¹¹ It is beyond the scope of this analysis to evaluate the legality of various conservation efforts, however we note it here as a primary concern of the Trust.

73. In addition, in the case that critical habitat designation results in changes to the planned development (e.g., reduced scope or scale of the plan due to any onsite conservation requirements), the following indirect impacts may result:

- The revenue-generating capacity of the project would be reduced, affecting the Trust's ability to fulfill its fiduciary duties to its beneficiaries (Native Hawaiian children).¹¹² This issue is paramount to the Trust.
- The regional economic and social benefits of the development would be reduced. As described in Section 2.4, the master plan incorporates community benefits, such as open space, job opportunities, and walkable neighborhoods. If a portion of the area would not be available for development, the current plan would be unviable.¹¹³ The Trust expects the alternative development plan that would be implemented would most likely be less desirable (according to the KCDP) and

¹⁰⁸ Personal communication with the Service on February 13, 2013.

¹⁰⁹ Personal communication with the Queen Liliuokalani Trust on February 28, 2013.

¹¹⁰ Personal communication with the Queen Liliuokalani Trust on February 28, 2013.

¹¹¹ Personal communication with the Queen Liliuokalani Trust on March 11, 2013.

¹¹² Queen Liliuokalani Trust to Industrial Economics, Inc. February 23, 2013. "Socio Economic Impact of Critical Habitat Designation for the Keahuolu Lands of the Queen Liliuokalani Trust." Prepared by John M. Knox & Associates, Inc. with assistance from Dinell Associates, LLC.

¹¹³ *Ibid.*

include more sprawl-like development that exacerbates adverse impacts to water quality, congestion, and energy demand. This would preclude beneficial elements of the current project, such as the inclusion of open space and compact walkable communities.¹¹⁴

- Finally, the Trust provides social services to orphaned and destitute Native Hawaiian children. In the case that they generate less revenue for this purpose, these services may need to be generated via alternative programs.¹¹⁵

2.7 ASSUMPTIONS AND LIMITATIONS

74. Exhibit 2-8 summarizes the major assumptions and caveats underlying the analysis of impacts to development and transportation projects. Overall, these uncertainties result in an underestimate of the quantified impacts of the designation reported in this analysis.

EXHIBIT 2-8. ASSUMPTIONS AND LIMITATIONS OF THE ANALYSIS

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS OF QUANTIFIED IMPACTS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
For the Department of Hawaiian Home Lands' project occurring in proposed critical habitat Unit 33 (the only project identified as likely to occur in proposed critical habitat for which there is likely to be a Federal nexus), it is currently uncertain what conservation efforts will ultimately be employed due to the presence of critical habitat.	May result in an underestimate of costs.	Potentially major. The Service has suggested it may recommend offsetting habitat disturbance associated with the Department's development through conservation of 50 to 150 acres elsewhere within the critical habitat area. The Department has suggested this would be infeasible. The Service and the Department plan to discuss an approach to conservation that will avoid adverse modification of critical habitat. The outcome of those discussions is uncertain. Any costs of the conservation for the Big Island plant species would be incremental costs of the critical habitat designation as the area is not occupied by the plant species.
Potential for portions of the designation to be reclassified as Conservation District lands is unknown.	May result in an underestimate of costs.	Potentially major. In the case that the State redistricts lands to the Conservation District as a result of critical habitat, future land use opportunities may be restricted and the value of the land reduced.
Potential for critical habitat to result in conservation requirements or environmental assessments as part of a zoning change request is unknown.	May result in an underestimate of costs.	Potentially major. In the case the County requires landowners to implement conservation measures or conduct environmental assessments as a result of critical habitat, indirect economic impacts would result.

¹¹⁴ *Ibid.*

¹¹⁵ Personal communication with the Queen Liliuokalani Trust on March 11, 2013.

2.8 BENEFITS OF THE PROPOSED CRITICAL HABITAT DESIGNATION

75. As discussed above, it is currently highly uncertain what additional conservation efforts may result from the designation of critical habitat. As a result, at this time we are unable to assess what economic benefits may result from the designation of critical habitat for the plants. However, in this section we provide an overview of the types of economic benefits we expect may result from the designation, should it result in changes in economic activity or land management.
76. The primary intended benefit of critical habitat is to support the conservation of threatened and endangered species. Thus, attempts to develop monetary estimates of the benefits of critical habitat designation would focus on the public's willingness to pay to achieve the conservation benefits to the species resulting from the designation. The published economics literature provides multiple examples of species and habitat valuation studies.¹¹⁶ No studies were identified, however, that evaluated conservation of the three plants.
77. Quantification and monetization of species conservation benefits requires information on the incremental change in the probability of conservation or increase in species populations that is expected to result from the designation. As a result, even if studies were available to determine the public's willingness to pay for the plants, our ability to quantify the direct benefits of the rule would be limited by the lack of information available relating the critical habitat designation to an expected population change or change in recovery potential for the plants. We therefore qualitatively describe the potential benefits that may result should the designation result in incremental conservation efforts for the plants.
78. As described in section 2.5 of this chapter, the Service suggested it they may recommend that the Department set aside 50 to 150 acres of land for conservation within critical habitat to avoid adverse impacts to critical habitat.^{117,118} While it is currently highly uncertain whether or not this recommendation will be made or implemented, there are various economic benefits that may derive from such a conservation effort, including:
- **Property value benefits:** Open space or decreased density of development resulting from conservation efforts for the plants may increase adjacent or nearby property values.

¹¹⁶ See, for example: Giraud, Kelly, Branka Turcin, John Loomis, and Joseph Cooper. 2002. Economic Benefit of the Protection Program for the Stellar Sea Lion. *Marine Policy* 26: 451-458; Jakobsson, Kristin M. and Andrew K. Dragun. 2001. The Worth of a Possum: Valuing Species with the Contingent Valuation Method. *Environmental and Resource Economics* 19:211-227; Kotchen, Matthew J. and Stephen D. Reiling. 2000. Environmental Attitudes, Motivations, and Contingent Valuation of Nonuse Values: A Case Study Involving Endangered Species. *Ecological Economics* 32: 93-107; Loomis, John and Earl Ekstrand. 1997. Economic Benefits of Critical Habitat for the Mexican Spotted Owl: A Scope Test Using a Multiple-Bounded Contingent Valuation Survey. *Journal of Agricultural and Resource Economics* 22(2): 356-366; Richardson, Leslie and John Loomis. 2009. The Total Economic Value of Threatened, Endangered and Rare Species: An Updated Meta-Analysis. *Ecological Economics* 68: 1535-1548; Stanley, Denise L. 2005. Local Perception of Public Goods: Recent Assessments of Willingness-to-Pay for Endangered Species. *Contemporary Economic Policy* 23(2): 165-179.

¹¹⁷ Note that the exact nature of the Service's recommendations would be determined during section 7 consultation and would depend on the specific nature of the proposed project.

¹¹⁸ Personal communication with the Service on February 13, 2013.

- **Improved water quality:** Decreased density of development in a region may improve water quality in the case that less impervious surface reduces nutrient loading and sedimentation to water bodies. Improved water quality may reduce water treatment costs and have human or ecological health benefits.
- **Educational benefits:** Monitoring of the plants' habitat confers educational benefits in that more is known about the species and where populations exist. This knowledge could help direct future conservation efforts.

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APPENDIX A | ADDITIONAL STATUTORY REQUIREMENTS

79. This appendix addresses the remaining analytical requirements under administrative law and executive order. Section A.1 presents an analysis of impacts to small entities which is conducted pursuant to the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 and Executive Order 13272. Section A.2 assesses the effects of the Proposed Rule on state, local, and Tribal governments and the private sector as required by Title II of the Unfunded Mandates Reform Act (UMRA) of 1995. Section A.3 addresses the potential for federalism concerns as required by Executive Order 13132. And Section A.4 considers potential impacts to the energy industry in response to Executive Order 13211, entitled, “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use.”
80. The analyses of impacts in this appendix rely on the estimated incremental impacts resulting from the proposed critical habitat designation. The incremental impacts of the rulemaking are most relevant for these analyses because they reflect costs that may be avoided or reduced based on decisions regarding the composition of the Final Rule.

A.1 SBREFA ANALYSIS

81. When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions as defined by the RFA).¹¹⁹ No initial regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities. To assist in this process, this appendix provides a screening level analysis of the potential for Big Island critical habitat to affect small entities.
82. To ensure broad consideration of impacts on small entities, the Service has prepared this small business analysis without first making the threshold determination in the Proposed Rule regarding whether the proposed critical habitat designation could be certified as not having a significant economic impact on a substantial number of small entities. This small business analysis will therefore inform the Service’s threshold determination.

¹¹⁹ 5 U.S.C. §601 *et seq.*

A.1.1 BACKGROUND AND FRAMEWORK FOR THE THRESHOLD ANALYSIS

83. This analysis is intended to improve the Service's understanding of the potential effects of the Proposed Rule on small entities and to identify opportunities to minimize these impacts in the Final Rule. The Act requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable. Section 4(b)(2) of the Act requires that the Service designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts, of specifying any particular area as critical habitat." This section grants the Secretary of the Interior discretion to exclude any area from critical habitat if (s)he determines "the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat." However, the Secretary may not exclude an area if it "will result in the extinction of the species."
84. Three types of small entities are defined in the RFA:
- **Small Business** - Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently-owned and operated and is not dominant in its field of operation. The Small Business Administration (SBA) has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR 121.201. The size standards are matched to North American Industry Classification System (NAICS) industries. The SBA definition of a small business applies to a firm's parent company and all affiliates as a single entity.
 - **Small Governmental Jurisdiction** - Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.
 - **Small Organization** - Section 601(4) defines a small organization as any not-for-profit enterprise that is independently-owned and operated and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc.
85. The courts have held that the RFA/SBREFEA requires Federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy Regulatory Commission (FERC)*, FERC proposed regulations affecting the manner in which generating utilities incorporated construction work in progress in their rates. The generating utilities that expected to be regulated were large businesses; however, their

customers -- transmitting utilities such as electric cooperatives -- included numerous small entities. In this case, the court agreed that FERC simply authorized large electric generators to pass these costs through to their transmitting and retail utility customers, and FERC could therefore certify that small entities were not directly impacted within the definition of the RFA.¹²⁰

86. Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency* (EPA) addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and particulate matter.¹²¹ The basis of EPA's RFA/SBREFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of state plans that incorporated the standards. The court found that, while EPA imposed regulation on states, it did not have authority under this rule to impose regulations directly on small entities and therefore small entities were not directly impacted within the definition of the RFA.
87. Following the court decisions described above, this analysis considers only those entities directly regulated by the Proposed Rule. 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, under a strict interpretation of the definition of a "directly regulated entity," only Federal action agencies are subject to a regulatory requirement (i.e., to avoid adverse modification) as the result of the designation. Because Federal agencies are not small entities, under this interpretation, the Service may certify that the proposed critical habitat rule will not have a significant economic impact on a substantial number of small entities.
88. 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. While these entities are not directly regulated, the Service has requested information regarding the potential number of third parties participating in consultations on an annual basis in order to ensure a robust examination of the effects of this proposed rule. Below, we provide that information. We also provide information to assist the Service in determining whether these entities are likely to be "small," and whether the number of potentially affected small entities is "substantial."¹²²

A.1.2 RESULTS OF THE THRESHOLD ANALYSIS

89. Following RFA and SBREFA, the purpose of this threshold analysis is to determine if the critical habitat designation will have a significant economic impact on a substantial number of small entities. Importantly, the impacts of the rule must be *both significant and* affect a substantial number of small entities to prevent certification of the rule. If a substantial number of small entities are affected by the critical habitat designation, but the

¹²⁰ *Mid-Tex Electric Cooperative, INC. V. Federal Energy Regulatory Commission*, 773 F. 2d 327 (D.C. Cir. 1985).

¹²¹ *American Trucking Association vs. EPA*, 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

¹²² The RFA does not provide quantitative thresholds to defining the terms "substantial" and "significant." In its guidance to Federal agencies on complying with the RFA, SBA provides qualitative descriptions of these terms, leaving the Agencies with discretion to interpret these terms on a case-by-case basis.

per-entity economic impact is not significant, the Service may certify. Likewise, if the per-entity economic impact is likely to be significant, but the number of affected entities is not substantial, the Service may also certify. To assist the Service in making this determination, this analysis presents information on both the number of small entities that may be affected and the magnitude of the expected impacts.

90. As described in Chapter 2, we anticipate eight future section 7 consultations on development and transportation projects identified as likely to occur within proposed critical habitat within the ten year timeframe of the analysis. We assume all consultations will occur in 2013, following critical habitat designation. We assume that the Federal agencies involved in the consultations will be the U.S. Army Corps of Engineers or HUD, and that the consultations will likely include the following third parties.
91. For these consultations, we estimate that third parties incur approximately \$900 in administrative costs to participate in the consultation (see Appendix B, Exhibit B-1). As described in Chapter 1, for projects located in occupied areas of the proposed critical habitat designation, incremental impacts of the designation are likely limited to these administrative costs for participation in the consultations. For projects located in unoccupied areas of the proposed critical habitat designation, incremental impacts may also include costs associated with additional conservation efforts implemented as a result of section 7 consultation. However, as discussed in Chapter 2, uncertainty regarding the scope and scale of these recommendations precludes quantifying these impacts at this time.
92. Exhibit A-1 provides information about the third parties likely to be involved in future section 7 consultations for projects identified in the analysis as both likely to occur within critical habitat and likely to involve a Federal nexus compelling section 7 consultation.

EXHIBIT A-1. THIRD PARTIES LIKELY TO BE INVOLVED IN FUTURE SECTION 7 CONSULTATIONS

PROJECT ¹	PROPOSED CRITICAL HABITAT UNIT	OCCUPIED ²	EXCLUSIONS ³	THIRD PARTY	SMALL BUSINESS?
Palamanui Hiluhilu Development	Unit 33	Yes	Area is under consideration for exclusion	Palamanui Global Holdings LLC	Unknown
University of Hawaii, West Hawaii Community College	Unit 33	Yes	N/A	University of Hawaii	No
Department of Hawaiian Home Lands Residential Project	Unit 33	No	N/A	Department of Hawaiian Home Lands	No
Kaloko Makai Project	Unit 34	Yes	Area is under consideration for exclusion	Kaloko Properties Corporation, SCD-TSA	Unknown

PROJECT ¹	PROPOSED CRITICAL HABITAT UNIT	OCCUPIED ²	EXCLUSIONS ³	THIRD PARTY	SMALL BUSINESS?
				Kaloko Makai, and TSA Corporation	
Ane Keohokalole Highway Project	Unit 34	Yes	N/A	Unknown ⁴	Unknown
State Judiciary and Regional Park Project	Unit 35	Yes	N/A	State of Hawaii	No
Department of Hawaiian Home Lands Villages of Laiopua	Unit 35	Yes	Area is under consideration for exclusion	Department of Hawaiian Home Lands	No
FHT Kamakena Project	Unit 35	Yes	N/A	Forest City Kona	No ⁵
<p>Notes:</p> <p>1. In addition to the projects identified in this table, the analysis also identifies a Waikoloa Village Association project in proposed critical habitat Unit 32 and a Queen Lili`uokalani Trust project in proposed critical habitat Unit 35. However, these projects are unlikely to involve a Federal nexus compelling section 7 consultation (Personal communication with Waikoloa Village Association on February 21, 2013; Personal communication with Queen Lili`uokalani Trust on February 28, 2013).</p> <p>2. The Service identified whether it considers the location of each project to be an area that currently supports one or more of the three Big Island plants subject to proposed critical habitat (Personal communication with the Service on February 11, 2013).</p> <p>3. 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63988.</p> <p>4. Because information regarding the specific location of Phase III of the Ane Keohokalole Highway is not available, it is uncertain what, if any, individual landowners may be involved in future section 7 consultation on the project as a result of their land overlapping proposed critical habitat.</p> <p>5. Forest City Kona is a subsidiary of Forest City Enterprises, Inc., which is not a small entity, with net revenues for 2011 reported as being over \$1 billion (Forest City Enterprises, Inc. 2012. Form 10-K for the fiscal year ended January 31, 2012. Available at http://ir.forestcity.net/phoenix.zhtml?c=88464&p=irol-reportsannual, accessed on March 11, 2013).</p>					

93. As identified in Exhibit A-1, the third parties for five of the eight projects identified in the analysis are not considered small businesses. As it is unknown whether or not the third parties associated with the remaining three projects are small businesses, we conservatively assume that they are small businesses. The per consultation third party cost of participating in a formal consultation is estimated to be \$900, as described in Appendix B, Exhibit B-1. Exhibit A-2 provides information on the average annual revenues of small entities in the development industry, calculated using Risk Management Association (RMA) data. As detailed in the exhibit, the per-entity cost to participate in a single consultation likely represents approximately 0.01 percent or less of annual revenues. Note that the average annual revenues reported in Exhibit A-2 are

derived from nationwide data, as there is limited data available to assess revenues of these types of businesses in Hawaii County, and therefore the revenues of these particular third parties may be far less. However, the estimated per-consultation cost of \$900 is not likely to represent a significant portion of revenues for each third party.

EXHIBIT A-2. RFA/SBREF A THRESHOLD ANALYSIS RESULTS SUMMARY

ACTIVITY	AFFECTED ENTITIES	IMPACTS PER SMALL ENTITY ²	ANNUAL REVENUES PER SMALL ENTITY ³	IMPACTS AS % OF ANNUAL REVENUES
Development	New Single-Family Housing Construction (236115); New Multifamily Housing Construction (236116); New Housing Operative Builders (236117); Commercial and Institutional Building (236220); Land Subdivision (237210)	\$900	\$6.2 million	0.01%
Transportation	Highway, Street and Bridge Construction (237310); Other Heavy and Civil Engineering Construction (237990)	\$900	\$9 million	<0.01%
<p>Notes:</p> <p>1. Detailed analysis presented in this Appendix.</p> <p>2. See Exhibit Appendix B, Exhibit B-1. IEC's analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2011, and a review of consultation records from several Service field offices across the country conducted in 2002.</p> <p>3. Annual revenues are estimated using Risk Management Association (RMA), Annual Statement Studies: Financial Ratio Benchmarks 2012 to 2013, 2012. For each NAICS code, RMA provides the net sales and the number of entities falling within several sales categories nationwide: \$0 to \$1 million, \$1 to 3 million, \$3 to \$5 million, \$5 to 10 million, or \$10 to \$25 million. Based on the number of entities and total net sales falling within each sales category, we developed an estimate of the weighted average net sales (revenues) per small entity.</p>				

A.2 UMRA ANALYSIS

94. Title II of UMRA requires agencies to assess the effects of their regulatory actions on state, local, and Tribal governments and the private sector.¹²³ Under Section 202 of UMRA, the Service must prepare a written statement, including a cost-benefit analysis, for rules that may result in the expenditure by state, local, and Tribal governments, in the aggregate, or by the private sector, of \$100 million or more in any one year. If a written statement is needed, Section 205 of UMRA requires the Service to identify and consider a reasonable number of regulatory alternatives. The Service must adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule, unless the Secretary publishes an explanation of why that alternative was not

¹²³ 2 U.S.C. 1531 et seq.

adopted. The provisions of Section 205 do not apply when they are inconsistent with applicable law.

95. As stated in the Proposed Rule, “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.”¹²⁴ Therefore, this rule does not place an enforceable duty upon state, local, or Tribal governments, or the private sector.

A.3 FEDERALISM IMPLICATIONS

96. Executive Order 13132, entitled “Federalism,” requires the Service to develop an accountable process to ensure “meaningful and timely input by state and local officials in the development of regulatory policies that have federalism implications.”¹²⁵ “Policies that have federalism implications” are defined in the Executive Order to include regulations that have “substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.”¹²⁶ Under Executive Order 13132, the Service may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by state and local governments, or the Service consults with state and local officials early in the process of developing the regulation.
97. This Proposed Rule does not have direct federalism implications. The designation of critical habitat directly affects only the responsibilities of Federal agencies. As a result, the Proposed Rule does not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government, as specified in the Order.
98. State or local governments may be indirectly affected by the proposed designation if they require Federal funds or formal approval or authorization from a Federal agency as a prerequisite to conducting an action. In these cases, the state or local government agency may participate in the section 7 consultation as a third party. As discussed in Chapter 1, projects occurring in occupied areas of the critical habitat designation are unlikely to experience incremental impacts beyond the administrative costs of consultation. All state or local government projects identified in the analysis are identified by the Service as

¹²⁴ 2012 Proposed Rule, 77 FR 63928.

¹²⁵ 64 FR 43255.

¹²⁶ *Ibid.*

within occupied areas of the designation.¹²⁷ Therefore, the proposed designation of critical habitat is also not expected to have substantial direct impacts on state or local governments.

A.4 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

99. Pursuant to Executive Order No. 13211, “Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,” issued May 18, 2001, Federal agencies must prepare and submit a “Statement of Energy Effects” for all “significant energy actions.” The purpose of this requirement is to ensure that all Federal agencies “appropriately weigh and consider the effects of the Federal Government’s regulations on the supply, distribution, and use of energy.”¹²⁸
100. OMB provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute “a significant adverse effect” when compared with the regulatory action under consideration:
- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
 - Reductions in fuel production in excess of 4,000 barrels per day;
 - Reductions in coal production in excess of 5 million tons per year;
 - Reductions in natural gas production in excess of 25 million Mcf per year;
 - Reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity;
 - Increases in energy use required by the regulatory action that exceed the thresholds above;
 - Increases in the cost of energy production in excess of one percent;
 - Increases in the cost of energy distribution in excess of one percent; or
 - Other similarly adverse outcomes.¹²⁹
101. As described in Chapter 1, the designation of critical habitat for the plants is not anticipated to result in any impacts to the energy industry.

¹²⁷ Personal communication with the Service on February 11, 2013.

¹²⁸ Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.

¹²⁹ *Ibid.*

APPENDIX B | FRAMEWORK FOR THE ANALYSIS

102. The purpose of this report is to evaluate the economic impact of actions taken to protect the Big Island species and their critical habitat as currently proposed, and specifically those impacts attributable to the designation of critical habitat. This analysis examines the potential impacts of restricting or modifying specific land uses or activities as a result of designating critical habitat. This analysis employs "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections afforded the species absent critical habitat designation, including listing under the Act and other Federal, State, and local regulations. 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 that are expected to occur solely due to the designation of Big Island critical habitat.
103. According to section 4(b)(2) of the Act, the Service must consider the economic impacts, impacts to national security, and other relevant impacts of designating any particular area as critical habitat. An area may be excluded from designation as critical habitat if the benefits of exclusion (i.e., the impacts that would be avoided if an area were excluded from the designation) outweigh the benefits of designation, so long as exclusion of the area will not result in extinction of the species. **The purpose of the economic analysis is to provide information to assist the Secretary of the DOI in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.**¹³⁰ In addition, this information allows the Service to address the requirements of E.O.s 12866 (as amended by 13563), 13211, and 12630, the RFA, as amended by SBREFA.¹³¹
104. This chapter describes the framework for this analysis. The chapter first provides a background of case law that led to the selection of the framework applied in this report. We then describe in economic terms the general categories of economic effects that are the focus of the impact analysis, including a discussion of both efficiency and distributional effects. This chapter then defines the analytic framework used to measure these impacts in the context of critical habitat regulation and the consideration of benefits. It concludes with a description of the information sources relied upon in the analysis.

¹³⁰ 16 U.S.C. §1533(b)(2).

¹³¹ Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993; Executive Order 13563, *Improving Regulation and Regulatory Review*, January 18, 2011; Executive Order 13211, *Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use*, May 18, 2001; 5. U.S.C. §§601 *et seq.* and Pub Law No. 104-121.

B.1 BACKGROUND

105. This analysis examines the potential impacts of restricting or modifying specific land uses or activities due to the designation of critical habitat. The U.S. Office of Management and Budget's (OMB) guidelines for conducting economic analysis of regulations direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action."¹³² In other words, the baseline includes the existing restrictions or other constraints on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e., occurring over and above existing constraints) are attributable to the proposed regulation. Significant debate has occurred regarding whether assessing the impacts of the Service's proposed regulations using this baseline approach is appropriate in the context of critical habitat designations.
106. In 2001, the U.S. Tenth Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, regardless of whether those impacts are attributable co-extensively to other causes.¹³³ Specifically, the court stated,

“The statutory language is plain in requiring some kind of consideration of economic impact in the CHD [critical habitat designation] phase. Although 50 C.F.R. 402.02 is not at issue here, the regulation's definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless. We are compelled by the canons of statutory interpretation to give some effect to the congressional directive that economic impacts be considered at the time of critical habitat designation.... Because economic analysis done using the FWS's [Fish and Wildlife Service's] baseline model is rendered essentially without meaning by 50 C.F.R. § 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes. Thus, we hold the baseline approach to economic analysis is not in accord with the language or intent of the ESA [Endangered Species Act].”¹³⁴

107. Since that decision, however, courts in other cases have held that an incremental analysis of impacts stemming solely from the critical habitat rulemaking is proper.¹³⁵ For example, in the March 2006 ruling that the August 2004 critical habitat rule for the

¹³² OMB, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars_a004_a-4.

¹³³ *New Mexico Cattle Growers Assn. v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

¹³⁴ *Ibid.*

¹³⁵ *Cape Hatteras Access Preservation Alliance v. Department of Interior*, 344 F. Supp. 2d 108 (D.D.C.); *Center for Biological Diversity v. United States Bureau of Land Management*, 422 F. Supp. 2d 1115 (N.D. Cal. 2006).

Peirson's milk-vetch was arbitrary and capricious, the United States District Court for the Northern District of California stated,

The Court is not persuaded by the reasoning of *New Mexico Cattle Growers*, and instead agrees with the reasoning and holding of *Cape Hatteras Access Preservation Alliance v. U.S. Dep't of the Interior*, 344 F. Supp 2d 108 (D.D.C. 2004). That case also involved a challenge to the Service's baseline approach and the court held that the baseline approach was both consistent with the language and purpose of the ESA and that it was a reasonable method for assessing the actual costs of a particular critical habitat designation *Id* at 130. 'To find the true cost of a designation, the world with the designation must be compared to the world without it.'¹³⁶

108. More recently, in 2010, the U.S. Ninth Circuit Court of Appeals came to similar conclusions during its review of critical habitat designations for the Mexican spotted owl and 15 vernal pool species.¹³⁷ Plaintiffs in both cases requested review by the Supreme Court, which declined to hear the cases in 2011.
109. In order to address the divergent opinions of the courts and provide the most complete information to decision-makers, this economic analysis will employ "without critical habitat" and "with critical habitat" scenarios:
- The "**without critical habitat**" scenario represents the **baseline** for the analysis, considering protections already afforded the Big Island species. The baseline for this analysis is the state of regulation, absent designation of critical habitat that provides protection to the species under the Act, as well as under other Federal, State and local laws and conservation plans. The baseline includes sections 7, 9, and 10 of the Act to the extent that they are expected to apply absent the designation of critical habitat for the species. The analysis will qualitatively describe how baseline conservation for the Big Island species is currently implemented across the proposed designation in order to provide context for the incremental analysis.
 - The "**with critical habitat**" scenario describes and monetizes the **incremental** impacts due specifically to the designation of critical habitat for the species. The incremental Big Island conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat. This report focuses on the incremental analysis.
110. Incremental effects of critical habitat designation are determined using the Service's December 9, 2004 interim guidance on "Application of the 'Destruction or Adverse Modification' Standard Under Section 7(a)(2) of the Endangered Species Act" and information from the Service regarding what potential consultations and project

¹³⁶ *Center for Biological Diversity v. United States Bureau of Land Management* 422 F. Supp.2d 1115 (N.D. Cal. 2006).

¹³⁷ *Home Builders Association of Northern California v. United States Fish and Wildlife Service*, 616 F.3d 983 (9th Cir. 2010), cert. denied, 179 L. Ed 2d 301, 2011 U.S. Lexis 1392, 79 U.S.L.W. 3475 (2011); *Arizona Cattle Growers v. Salazar*, 606 F. 3d 1160 (9th Cir. 2010), cert. denied, 179 L. Ed. 2d 300, 2011 U.S. Lexis 1362, 79 U.S.L.W. 3475 (2011).

modifications may be imposed as a result of critical habitat designation over and above those associated with the listing.¹³⁸ Specifically, in *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, the Ninth Circuit invalidated the Service's regulation defining destruction or adverse modification of critical habitat, and the Service no longer relies on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat.¹³⁹ Under the statutory provisions of the Act, the Service determines destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional to serve its intended conservation role for the species.

111. A detailed description of the methods used to define baseline and incremental impacts is provided in Section B.3.

B.2 CATEGORIES OF POTENTIAL ECONOMIC EFFECTS OF SPECIES CONSERVATION

112. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the Big Island species and their habitat (hereinafter referred to collectively as "Big Island conservation efforts"). Economic efficiency effects generally reflect "opportunity costs" associated with the commitment of resources required to accomplish species and habitat conservation. For example, if the set of activities that may take place on a parcel of land is limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal Action Agency to consult with the Service under section 7 represent opportunity costs of Big Island conservation efforts.
113. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether species conservation efforts are likely to affect a particular group or economic sector. For example, while conservation efforts may have a small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts. The differences between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

B.2.1 EFFICIENCY EFFECTS

114. At the guidance of OMB and in compliance with Executive Order 12866 "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the

¹³⁸ Director, U.S. Fish and Wildlife Service, Memorandum to Regional Directors and Manager of the California-Nevada Operations Office, Subject: Application of the "Destruction or Adverse Modification" Standard under Section 7(a)(2) of the Endangered Species Act, dated December 9, 2004.

¹³⁹ *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, 378 F.3d 1059 (9th Circuit 2004).

context of regulations that protect Big Island habitat, these efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.¹⁴⁰

115. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets -- that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price -- the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.
116. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, protection measures that reduce or preclude the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market.
117. This analysis begins by measuring impacts associated with efforts undertaken to protect the Big Island species and their habitat. As noted above, in some cases, compliance costs can provide a reasonable estimate of changes in economic efficiency. However, if the cost of conservation efforts is expected to significantly impact markets, the analysis will consider potential changes in consumer and/or producer surplus in affected markets. As described in Chapter 2, in the case of the Big Island species, conservation efforts resulting from the rule are currently uncertain but are not anticipated to involve a large number of projects or a large land area and therefore are unlikely to significantly affect markets; therefore, this report focuses on compliance costs.

B.2.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

118. Measurements of changes in economic efficiency focus on the net impact of conservation efforts, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.¹⁴¹ This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply,

¹⁴⁰ For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich, Edward M., *A Guide to Benefit-Cost Analysis* (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency, *Guidelines for Preparing Economic Analyses*, EPA 240-R-00-003, September 2000, available at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.

¹⁴¹ OMB, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars_a004_a-4.

distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

Impacts on Small Entities, Governments and Energy Supply, Distribution, and Use

119. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the RFA, might be affected by future species conservation efforts.¹⁴² It also assesses the potential for impacts to State, local, and Tribal governments and the private sector as required by Title II of UMRA.¹⁴³ Finally, in response to Executive Order 13211 "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future impacts of conservation efforts on the energy industry and its customers.¹⁴⁴

Regional Economic Effects

120. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreators) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreators). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.
121. The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.
122. Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition,

¹⁴² 5 U.S.C. §§601 *et seq.*

¹⁴³ 2 U.S.C. 1531 *et seq.*

¹⁴⁴ Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.

123. Quantified impacts associated with Big Island critical habitat reflect increased administrative effort to participate in section 7 consultations. As described in Chapter 2, critical habitat designation is not expected to affect the levels of economic activity occurring within the region. Therefore, measurable impacts of the type typically assessed with input-output models are not anticipated.

B.3 ANALYTIC FRAMEWORK AND SCOPE OF THE ANALYSIS

124. This analysis: 1) identifies those economic activities most likely to pose a threat to the Big Island species and their habitat; 2) describes the baseline regulation protection for the species; and 3) monetizes the incremental economic impacts to avoid adverse modification of the proposed critical habitat area. This section provides a description of the methods used to separately identify baseline protections from the incremental impacts stemming from the proposed designation of critical habitat for the Big Island species. This evaluation of impacts in a "with critical habitat designation" versus a "without critical habitat designation" framework effectively measures the net change in economic activity associated with the proposed rulemaking.

B.3.1 IDENTIFYING BASELINE IMPACTS

125. The baseline for this analysis is the existing state of regulation, absent the designation of critical habitat, including the listing of the species under the Act, as well as protection under other Federal, State and local laws and guidelines. This "without critical habitat designation" scenario also considers a wide range of additional factors beyond the compliance costs of regulations that provide protection to the listed species. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by the Service and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.
126. Baseline protections include sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections to the extent that they are expected to occur absent the designation of critical habitat for the species. This analysis describes these baseline regulations and, where possible, provides examples of the potential magnitude of the costs of these baseline protections. The primary focus, however, is not on baseline costs, since these will not be affected by the proposed regulation. Instead, the focus of this analysis is on monetizing the incremental impacts forecast to result from the proposed critical habitat designation.
- Section 7 of Act, even absent critical habitat designation, requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. Consultations under the jeopardy standard result in

administrative costs, as well as impacts of conservation efforts resulting from consideration of this standard.

- Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."¹⁴⁵ The economic impacts associated with this section manifest themselves in sections 7 and 10.
- Under section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for a listed animal species in order to meet the conditions for issuance of an incidental take permit in connection with a land or water use activity or project.¹⁴⁶ The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately avoided or minimized. The development and implementation of HCPs is considered a baseline protection for the species and habitat unless the HCP is determined to be precipitated by the designation of critical habitat, or the designation influences stipulated conservation efforts under HCPs.

Enforcement actions taken in response to violations of the Act are not included in this analysis.

127. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. If compliance with the Clean Water Act (CWA) or State environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are categorized accordingly. Of note, however, is that such efforts may not be considered baseline in the case that they would not have been triggered absent the designation of critical habitat. In these cases, they are considered incremental impacts and are discussed below.

B.3.2 IDENTIFYING INCREMENTAL IMPACTS

128. This analysis quantifies the potential incremental impacts of this rulemaking. The focus of the incremental analysis is to determine the impacts on land uses and activities from the designation of critical habitat that are above and beyond those impacts resulting from existing required or voluntary conservation efforts being undertaken due to other Federal, State, and local regulations or guidelines.
129. When critical habitat is designated, section 7 requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to considering whether the actions are likely to jeopardize the continued existence of the species). The added administrative costs of including consideration of

¹⁴⁵ 16 U.S.C. 1532.

¹⁴⁶ U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at <http://endangered.fws.gov/hcp/>.

critical habitat in section 7 consultations, and the additional impacts of implementing conservation efforts (i.e., reasonable and prudent alternatives) resulting from the protection of critical habitat are the direct compliance costs of designating critical habitat. These costs are not in the baseline and are considered incremental impacts of the rulemaking.

130. Incremental impacts may be the direct compliance costs associated with additional effort for consultations, reinitiated consultations, new consultations occurring specifically because of the designation, and additional consultation efforts that would not have been requested under the jeopardy standard. Additionally, incremental impacts may include indirect impacts resulting from designation of critical habitat, triggering of additional requirements under State or local laws intended to protect sensitive habitat, and uncertainty and perceptual effects on markets.

Direct Impacts

131. The direct, incremental impacts of critical habitat designation stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct, incremental impacts of critical habitat designation are: 1) the administrative costs of conducting section 7 consultation; and 2) implementation of any conservation efforts that might be taken by the Action Agency in conjunction with section 7 consultation to avoid potential destruction or adverse modification of critical habitat.
132. Section 7(a)(2) of the Act requires Federal agencies to consult with the Service whenever activities that they undertake, authorize, permit, or fund may affect a listed species or designated critical habitat. In some cases, consultations will involve the Service and another Federal agency only, such as the U.S. Army Corps of Engineers (Corps). Often, they will also include a third party involved in projects that involve a permitted entity, such as the recipient of a CWA section 404 permit.
133. During a consultation, the Service, the Action Agency, and the entity applying for Federal funding or permitting (if applicable) communicate in an effort to minimize potential adverse effects to the species and/or to the proposed critical habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, and the potential effects to the species and designated critical habitat associated with the proposed activity, the Federal agency, and whether there is a private applicant involved.
134. Section 7 consultations with the Service may be either informal or formal. *Informal consultations* consist of discussions between the Service, the Action Agency, and the applicant concerning an action that may affect a listed species or its designated critical habitat, and are designed to identify and resolve potential concerns at an early stage in the planning process to avoid adverse impacts to listed species and critical habitat. The informal consultation process is completed when the Service either concurs with the Action Agency's determination that the project is not likely to adversely affect the listed

resource or the Action Agency requests formal consultation to address the adverse effect. By contrast, a *formal consultation* is required if the Action Agency determines that its proposed action is likely to adversely affect the listed species or designated critical habitat in ways that cannot be avoided. The formal consultation process results in the Service's determination in its Biological Opinion of whether the action is likely to jeopardize a species or adversely modify critical habitat, and recommendations to minimize those impacts. Regardless of the type of consultation or proposed project, section 7 consultations can require administrative effort on the part of all participants.

Administrative Section 7 Consultation Costs

135. Parties involved in section 7 consultations include the Service, a Federal "Action Agency," and in some cases, a private entity involved in the project or land use activity. The Action Agency (i.e., the Federal nexus necessitating the consultation) serves as the liaison with the Service. While consultations are required for activities that involve a Federal nexus and may affect a species regardless of whether critical habitat is designated, the designation may increase the effort for consultations in the case that the project or activity in question may adversely modify critical habitat. Administrative efforts for consultation may therefore result in both baseline and incremental impacts.
136. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:
1. **Additional effort to address adverse modification in a new consultation** - New consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond the listing issues. In this case, only the additional administrative effort required to consider critical habitat is considered an incremental impact of the designation.
 2. **Re-initiation of consultation to address adverse modification** - Consultations that have already been completed on a project or activity may require re-initiation to address critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and project modification costs are considered incremental impacts of the designation.
 3. **Incremental consultation resulting entirely from critical habitat designation** - Critical habitat designation may trigger additional consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the potential presence of the species provided by the designation). Such consultations may, for example, be triggered in critical habitat areas that are not occupied by the species. All associated administrative and project modification costs of incremental consultations are considered incremental impacts of the designation.
137. The administrative costs of these consultations vary depending on the specifics of the project. One way to address this variability is to show a range of possible costs of consultation, as it may not be possible to predict the precise outcome of each future

consultation in terms of level of effort. Review of consultation records and discussions with Service field offices resulted in a range of estimated administrative costs of consultation.

138. Exhibit B-1 provides the incremental administrative consultation costs applied in this analysis. To estimate the fractions of the total administrative consultation costs that are baseline and incremental, the following assumptions are applied.
- The greatest effort will be associated with consultations that consider both jeopardy and adverse modification. Depending on whether the consultation is precipitated by the listing or the critical habitat designation, part or all of the costs, respectively, will be attributed to the proposed rule to designate critical habitat.
 - Efficiencies exist when considering both jeopardy and adverse modification at the same time (e.g., in staff time saved for project review and report writing), and therefore incremental administrative costs of considering adverse modification in consultations precipitated by the listing result in the least incremental effort, roughly 25 percent of the cost of the entire consultation. The remaining 75 percent of the costs are attributed to consideration of the jeopardy standard in the baseline scenario. This latter amount also represents the cost of a consultation that only considers adverse modification (e.g., an incremental consultation for activities in unoccupied critical habitat) and is attributed wholly to critical habitat.
 - Incremental costs of the re-initiation of a previously completed consultation because of the critical habitat designation are assumed to be approximately half the cost of a consultation considering both jeopardy and adverse modification. This assumes that re-initiations are less time-consuming as the groundwork for the project has already been considered in terms of its effect on the species. However, because the previously completed effort must be re-opened, they are more costly than simply adding consideration of critical habitat to a consultation already underway.

EXHIBIT B-1. INCREMENTAL ADMINISTRATIVE CONSULTATION COSTS (2013 DOLLARS)

INCREMENTAL ADMINISTRATIVE COSTS OF CONSULTATION					
CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
NEW CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION (TOTAL COST OF A CONSULTATION CONSIDERING BOTH JEOPARDY AND ADVERSE MODIFICATION)					
Technical Assistance	\$600	n/a	\$1,000	n/a	\$2,000
Informal	\$2,000	\$3,000	\$2,000	\$2,000	\$10,000
Formal	\$6,000	\$6,000	\$3,000	\$5,000	\$20,000
Programmatic	\$20,000	\$10,000	n/a	\$6,000	\$40,000
RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION					
Technical Assistance	\$300	n/a	\$500	n/a	\$800
Informal	\$1,000	\$2,000	\$1,000	\$1,000	\$5,000

Formal	\$3,000	\$3,000	\$2,000	\$2,000	\$10,000
Programmatic	\$8,000	\$7,000	n/a	\$3,000	\$20,000
ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION					
Technical Assistance	\$100	n/a	\$300	n/a	\$400
Informal	\$600	\$800	\$500	\$500	\$2,000
Formal	\$1,000	\$1,000	\$900	\$1,000	\$5,000
Programmatic	\$4,000	\$3,000	n/a	\$1,000	\$9,000
Source: IEC's analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2011, and a review of consultation records from several Service field offices across the country conducted in 2002.					
Notes: 1. The level of effort per consultation represents approximate averages based on the best available information. The estimates in this table are accordingly rounded to one significant digit to reflect this imprecision. 2. Estimates reflect average hourly time required by staff.					

Section 7 Conservation Effort Impacts

139. Section 7 consultation considering critical habitat may also result in additional conservation effort recommendations specifically addressing potential destruction or adverse modification of critical habitat. For forecast consultations considering jeopardy and adverse modification, and for re-initiations of past consultations to consider critical habitat, the economic impacts of conservation efforts undertaken to avoid adverse modification are considered incremental impacts of critical habitat designation. For consultations that are forecast to occur specifically because of the designation (incremental consultations), impacts of all associated conservation efforts are assumed to be incremental impacts of the designation. This is summarized below.

1. **Additional effort to address adverse modification in a new consultation -** Only project modifications above and beyond what would be requested in informal consultation to minimize effects to the species or required in formal consultation to avoid jeopardy are considered incremental.
2. **Re-initiation of consultation to address adverse modification -** Only project modifications above and beyond what was requested to minimize effects to the species or avoid jeopardy are considered incremental.
3. **Incremental consultation resulting entirely from critical habitat designation** Impacts of all project modifications are considered incremental.

Indirect Impacts

140. The designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 under the Act. Indirect impacts are those unintended changes in economic behavior that may occur outside of the Act, through other Federal, State, or local actions, and that are caused by the designation of critical habitat. This section identifies common types of indirect impacts that may be associated with the designation of critical habitat. Importantly, these

types of impacts are not always considered incremental. In the case that these types of conservation efforts and economic effects are expected to occur regardless of critical habitat designation, they are appropriately considered baseline impacts in this analysis.

Habitat Conservation Plans

141. Under section 10 of the Act, landowners seeking an incidental take permit must develop an HCP that meets statutory requirements, including minimizing and mitigating the potential harmful effects of the incidental take to the maximum extent practicable. As such, the purpose of the habitat conservation planning process is to ensure that the effects of incidental take are adequately minimized or mitigated. Thus, HCPs are developed to ensure compliance with section 9 of the Act and to meet the requirements of section 10 of the Act.
142. Application for an incidental take permit and completion of an HCP are not required by a critical habitat designation. However, in certain situations the new information provided by the critical habitat rule may prompt a landowner to apply for an incidental take permit. For example, a landowner may have been previously unaware of the potential presence of the species on his or her property, and expeditious completion of an HCP may offer the landowner regulatory relief in the form of exclusion from the final critical habitat designation. In this case, the effort involved in creating the HCP and undertaking associated conservation actions are considered an incremental effect of designation. No specific plans to prepare new HCPs in response to this proposed designation were identified.

Other State and Local Laws

143. Under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation. Chapter 2 of this report discusses the potential for critical habitat to result in changes in state or county land management practices.

Additional Indirect Impacts

144. In addition to the indirect effects of compliance with other laws or triggered by the designation, project proponents, land managers and landowners may face additional indirect impacts, including the following:
- **Time Delays** - Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to reinitiate the section 7 consultation process and/or compliance with other laws triggered by the designation. To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation.
 - **Regulatory Uncertainty** - The Service conducts each section 7 consultation on a case-by-case basis and issues a biological opinion on formal consultations based on species-specific and site-specific information. As a result, government agencies

and affiliated private parties who consult with the Service under section 7 may face uncertainty concerning whether project modifications will be recommended by the Service and what the nature of these modifications will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. Where information suggests that this type of regulatory uncertainty stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation.

- **Stigma** - In some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated project modifications and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. All else equal, a property that is designated as critical habitat may have a lower market value than an identical property that is not adjacent to a stream designated as critical habitat due to perceived limitations or restrictions. As the public becomes aware of the true regulatory burden imposed by critical habitat, the impact of the designation on property markets may decrease. To the extent that potential stigma effects on markets are probable and identifiable, these impacts are considered indirect, incremental impacts of the designation.

145. Indirect impacts may also result from critical habitat providing new information regarding where project proponents should consult regarding potential impacts on the species or habitat. Because for one of the Big Island species (*Bidens micrantha ssp. ctenophylla*) the listing of the species and the critical habitat designation are being proposed coincidentally, it is difficult to determine whether the critical habitat designation specifically generates the understanding of the areas in which the species is present. In other words, it is unclear whether the critical habitat designation will generate improved understanding above and beyond that provided by the listing of where project proponents should consult with the Service.

Approach to Identifying Incremental Impacts

146. To inform our understanding of the potential effects of the critical habitat designation for the plants, the Service provided guidance (Appendix E) describing how it intends to consider conservation recommendations for the plants in future section 7 consultations with critical habitat versus without critical habitat. The following summary distills the key findings of the Service's memorandum that inform our economic analysis:

Direct Incremental Impacts in Occupied Habitat Areas

- The presence of the plants across the proposed designation provides extensive baseline protection. Where the plants are present, projects or activities with a Federal nexus would be subject to section 7 consultation regardless of critical habitat designation. The Service expects to recommend conservation efforts in section 7 consultation to avoid and minimize impacts to the species, including

offsetting habitat loss (i.e. acquiring, restoring, and managing habitat, in perpetuity, to compensate for habitat disturbed).^{147,148} The recommendation to offset habitat disturbance would therefore most likely be made in occupied habitat regardless of critical habitat designation and critical habitat designation is unlikely to affect the offset ratio recommended (i.e., the ratio of conserved acres to disturbed acres).

- The Service states that the effect of critical habitat designation on the outcome of future consultations in occupied habitat may be the additional stipulation that the offsets be located within the critical habitat area, preferably within the affected unit.¹⁴⁹ However, the Service further notes that in order to minimize or avoid potential jeopardy, the conservation offsets would need to occur in areas that could support the species, specifically within the lowland dry ecosystem.¹⁵⁰ Because the proposed critical habitat area encompasses the lowland dry ecosystem that may support the plants, it is therefore most likely that the conservation offsets be located within the proposed critical habitat area even absent critical habitat designation.^{151,152}
- It is therefore unlikely that critical habitat designation will change the outcome of future section 7 consultations on projects or activities within occupied areas, and incremental impacts will most likely be limited to the additional administrative effort of considering adverse modification as part of consultation.

Direct Incremental Impacts in Unoccupied Habitat Areas

- In unoccupied areas, it is unlikely that projects or activities with a Federal nexus would be subject to section 7 consultation absent critical habitat designation. In this case, all costs associated with conservation efforts for the relevant plant species that are recommended in section 7 consultation, as well as the administrative costs of section 7 consultation, are direct incremental costs of the critical habitat designation.
- For the projects identified as occurring within unoccupied areas, the Service suggested it may recommend that 50 to 150 acres of land be set aside, as well as restored (if necessary) and managed, in perpetuity.^{153,154} According to the Service,

¹⁴⁷ *Ibid.*

¹⁴⁸ Note that the exact nature of the Service's recommendations would be determined during section 7 consultation and would depend on the specific nature of the proposed project.

¹⁴⁹ US Fish and Wildlife Service to Industrial Economics, Inc. January 15, 2013. "Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Designate Critical Habitat for 3 Species on the Island of Hawaii." See Appendix E.

¹⁵⁰ Personal communication with the Service on February 26, 2013.

¹⁵¹ *Ibid.*

¹⁵² 2012 Proposed Listing and Critical Habitat Rule, 77 FR 63981.

¹⁵³ Note that the exact nature of the Service's recommendations would be determined during section 7 consultation and would depend on the specific nature of the proposed project.

¹⁵⁴ Personal communication with the Service on February 13, 2013.

the offsetting could include a combination of onsite areas (on the portion of the project sites overlapping proposed critical habitat) and offsite areas elsewhere within the proposed critical habitat.¹⁵⁵

147. As the projects and activities occurring within occupied habitat areas are less likely to be directly affected by the critical habitat designation (i.e., impacts are most likely limited to administrative costs), our analysis focuses on projects occurring in areas where the three plant species are not present. Chapter 2 of this report evaluates projects proposed in unoccupied areas proposed for critical habitat designation. For all projects, regardless of whether they overlap occupied or unoccupied areas, we describe the potential indirect effects of the designation.

B.3.3 BENEFITS

148. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.¹⁵⁶ OMB's Circular A-4 distinguishes two types of economic benefits: *direct benefits and ancillary benefits*. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.¹⁵⁷
149. In the context of critical habitat, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.¹⁵⁸ *Rather than rely on economic measures, the Service believes that the direct benefits of the proposed rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*
150. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the PCEs on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.

¹⁵⁵ Personal communication with the Service on February 26, 2013.

¹⁵⁶ Executive Order 12866, Regulatory Planning and Review, September 30, 1993.

¹⁵⁷ OMB, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars_a004_a-4.

¹⁵⁸ *Ibid.*

B.3.4 GEOGRAPHIC SCOPE OF THE ANALYSIS

151. As described in Chapter 1, this analysis evaluates impacts of critical habitat designation on activities within or affecting the proposed critical habitat area. We evaluate impacts separately by unit for each unit. We also separately describe impacts within areas proposed for critical habitat designation from those areas being considered for exclusion from critical habitat designation.

B.3.5 ANALYTIC TIME FRAME

152. Ideally, the time frame of this analysis would be based on the expected time period over which the critical habitat regulation is expected to be in place. Specifically, the analysis would forecast impacts of implementing this rule through species recovery (i.e., when the rule is no longer required). 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 on the basis of a judgment about the foreseeable future.”¹⁵⁹ The “foreseeable future” for this analysis includes, but is not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. Forecasted impacts will be based on the planning periods for potentially affected projects. Specifically, we focus our analysis on those projects that are reasonably likely to occur based as indicated by existing plans or by landowners and land managers. As a result, this analysis considers economic impacts to activities over a ten-year period from 2013 (expected year of final critical habitat designation) through 2022.

B.4 INFORMATION SOURCES

153. The primary sources of information for this report are communications with, and data provided by, personnel from the Service, State and local government agencies, private landowners, and other stakeholders. In addition, this analysis relies upon the Service’s section 7 consultation record for the areas of proposed critical habitat. A complete list of references is provided at the end of the main text of this document.

B.5 PRESENTATION OF RESULTS

154. Impacts are described in present value and annualized terms applying discount rates of seven percent throughout the body of the report. Additionally, Appendix C provides the present and annualized value of impacts in each unit applying a three percent discount rate for comparison with values calculated at seven percent.¹⁶⁰ Appendix D presents undiscounted annual impact values by unit. Present value and annualized impacts are calculated according to the methods described in Exhibit B-2 below.
155. The level of effort per consultation and the potential costs of conservation measures in this analysis represent approximate averages based on the best available cost information.

¹⁵⁹ U.S. Office of Management and Budget, February 7, 2011. “Regulatory Impact Analysis: Frequently Asked Questions (FAQs).” Accessed on October 10, 2012 at http://www.whitehouse.gov/omb/circulars_a004_a-4.

¹⁶⁰ The U.S. Office of Management and Budget (OMB) directs Federal agencies to report results using discount rates of three and seven percent (see OMB, Circular A-4, 2003).

The economic impacts presented throughout this report are accordingly rounded to two significant digits to reflect this imprecision.

EXHIBIT B-2. CALCULATING PRESENT VALUE AND ANNUALIZED IMPACTS

This analysis compares economic impacts incurred in different time periods in present value terms. The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in today's dollars. Translation of economic impacts of past or future costs to present value terms requires the following: a) past or projected future costs of critical habitat designation; and b) the specific years in which these impacts have been or are expected to be incurred. With these data, the present value of the past or future stream of impacts (PV_c) from year t to T is measured in 2013 dollars according to the following standard formula:^a

$$PV_c = \sum_t^T \frac{C_t}{(1+r)^{t-2013}}$$

C_t = cost of Big Island critical habitat conservation efforts in year t

r = discount rate^b

Impacts for each activity in each unit are also expressed as annualized values. Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods (T). For this analysis, development activities employ a forecast period of ten years, 2013 through 2022. Annualized future impacts (APV_c) are calculated by the following standard formula:

$$APV_c = PV_c \left[\frac{r}{1 - (1+r)^{-N}} \right]$$

N = number of years in the forecast period (in this analysis, ten years)

^a To derive the present value of future impacts, t is 2013 and T is 2022.

^b To discount and annualize costs, guidance provided by the OMB specifies the use of a real rate of seven percent. In addition, OMB recommends sensitivity analysis using other discount rates such as three percent, which some economists believe better reflects the social rate of time preference. (U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 *Federal Register* 5492, February 3, 2003.)

APPENDIX C | SENSITIVITY OF RESULTS TO DISCOUNT RATE

This appendix summarizes the costs of Big Island conservation quantified in Chapter 2 of this report. It presents impacts assuming an alternative real discount rate of three percent (the main text of the report assumes a real discount rate of seven percent).¹⁶¹

EXHIBIT C-1. INCREMENTAL IMPACTS OF CRITICAL HABITAT (2013-2022, 2013 DOLLARS, THREE PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE IMPACTS (2013-2022)	ANNUALIZED IMPACTS	UNQUANTIFIED IMPACTS ²
AREAS PROPOSED FOR CRITICAL HABITAT DESIGNATION			
Unit 10	\$0	\$0	
Unit 31	\$0	\$0	
Unit 32	\$0	\$0	X
Unit 33	\$20,000	\$2,300	X
Unit 34	\$5,000	\$570	X
Unit 35	\$10,000	\$1,100	X
Unit 36	\$0	\$0	
Total Proposed for Designation	\$35,000	\$4,000	
AREAS BEING CONSIDERED FOR EXCLUSION			
Unit 10	\$0	\$0	
Unit 31	\$0	\$0	
Unit 32	\$0	\$0	
Unit 33	\$5,000	\$570	X
Unit 34	\$5,000	\$570	X
Unit 35	\$5,000	\$570	X
Unit 36	\$0	\$0	
Total Being Considered for Exclusion	\$15,000	\$1,700	
Notes:			
1. The level of effort per consultation and the potential costs of project modifications represent approximate averages based on the best available cost information, as described in Exhibit B-1 of Appendix B. The cost estimates in this report are accordingly rounded to two significant digits to reflect this imprecision. The cost estimates may therefore not sum to the total costs reported due to rounding.			
2. Unquantified impacts are discussed in section 2.6 of the report.			

¹⁶¹ A more detailed discussion of how to calculate present and annualized values, as well as the relevant discount rates, is provided in Appendix B of this report.

APPENDIX D | UNDISCOUNTED IMPACTS BY ECONOMIC ACTIVITY

This appendix summarizes undiscounted impacts by year and presents these impacts separately for areas proposed for designation and areas being considered for exclusion. These details are provided in accordance with OMB guidelines for developing benefit and cost estimates. OMB directs the analysis to: “include separate schedules of the monetized benefits and costs that show the type and timing of benefits and costs, and express the estimates in this table in constant, undiscounted dollars.”¹⁶²

EXHIBIT D-1. SUMMARY OF INCREMENTAL IMPACTS BY YEAR (2013\$)

YEAR	AREAS PROPOSED FOR CRITICAL HABITAT DESIGNATION	AREAS BEING CONSIDERED FOR EXCLUSION
2013	\$35,000	\$15,000
2014	\$0	\$0
2015	\$0	\$0
2016	\$0	\$0
2017	\$0	\$0
2018	\$0	\$0
2019	\$0	\$0
2020	\$0	\$0
2021	\$0	\$0
2022	\$0	\$0
Total	\$35,000	\$15,000

¹⁶² Office of Management and Budget, Circular A-4, September 17, 2003, p. 18. The reference to “constant” dollars indicates that the effects of general price level inflation (the tendency of all prices to increase over time) should be removed through the use of an inflation adjustment index.

APPENDIX E | INCREMENTAL EFFECTS MEMORANDUM FOR THE
ECONOMIC ANALYSIS FOR PROPOSED RULE TO DESIGNATE
CRITICAL HABITAT FOR 3 SPECIES ON THE ISLAND OF HAWAII

December 3, 2012

Memorandum
Email Transmission
Revised January 15, 2013

To: IEC
(Attention: Maura Flight)

From: Field Supervisor
Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii

Subject: Incremental Effects Memorandum for the Economic Analysis of
the Proposed Rule to Designate Critical Habitat for 3 Species on
the Island of Hawaii

The purpose of this memorandum is to provide information to serve as a basis for conducting an economic analysis for the proposed designation of critical habitat for three species. We are proposing critical habitat for one proposed species, *Bidens micrantha* ssp. *ctenophylla* (ko‘oko‘olau), and for two listed plants, *Isodendron pyrifolium* (wahine noho kula), and *Mezoneuron kawaiense* (uhiuhi), that do not have designated critical habitat on Hawaii Island (or Big Island). The proposed critical habitat designation totals 18,766 acres (ac) (7,597 hectares (ha)). This memorandum deals only with potential effects of the proposed critical habitat designation.

Determining the economic impacts of critical habitat designation involves evaluating the "without critical habitat" baseline (area only with species listed but without critical habitat) versus the "with critical habitat" scenario (area with critical habitat). Impacts of a designation equal the difference, or the increment, between these two scenarios. Measured differences between the baseline (area without critical habitat) and the designated critical habitat (area with critical habitat) may include (but are not limited to) changes in land or resource use, environmental quality, or time and effort expended on administrative and other activities by Federal landowners, Federal action agencies, and in some instances, State and local governments or private third parties. These are the "incremental effects" that serve as the basis for the economic analysis.

There are a number of ways that designation of critical habitat could influence activities, but one of the important functions of this memorandum is to explain any differences between conservation actions required to avoid jeopardy versus actions that may be required to avoid adverse modification. To perform this analysis, the Service considers how the proposed action is likely to affect the function of the critical habitat to serve the intended conservation role. The information provided below is intended to identify the possible differences for these species under the different section 7 standards.

Background

We are proposing critical habitat for 3 species on Hawaii Island (see Table 1). The proposed critical habitat totals 18,766 ac (7,597 ha) in 7 units for the 3 plants and includes lands under Federal (2%), state (64%), private (34%), and County of Hawaii (less than 1%) land ownership (see Table 5A in the October 17, 2012, Hawaii Island proposed rule). Approximately 55% of the area being proposed as critical habitat is already designated as critical habitat for other listed plant species or Blackburn's sphinx moth (*Manduca blackburni*). Critical habitat was designated for the Blackburn's sphinx moth in 2003 (68 FR 34710) on the islands of Maui, Molokai, Kahoolawe, and Hawaii. Designated critical habitat for Blackburn's sphinx moth was not proposed for revision in the October 17, 2012, Hawaii Island proposed rule.

Our approach to the Hawaii Island listing and critical habitat proposal is based on the recovery recommendations from three recovery plans for plants on this island (http://ecos.fws.gov/docs/recovery_plan/940506a.pdf; http://ecos.fws.gov/docs/recovery_plan/960926a.pdf; http://ecos.fws.gov/docs/recovery_plan/980511a.pdf); the report "Habitat Essential to the Recovery of Hawaiian Plants" (HPPRCC 1998); the report "An Ecoregional Assessment of Biodiversity Conservation for the Hawaiian High Islands" by The Nature Conservancy (including Geographic Information System (GIS) data for ecosystem mapping) (TNC 2006 and 2007); and other species-specific information provided by the Hawaii Biodiversity and Mapping Program (HBMP 2010); species experts, and other databases and GIS resources. We have proposed critical habitat for *Bidens micrantha* ssp. *ctenophylla*, *Isodendron pyrifolium*, and *Mezoneuron kawaiense* in this proposed rule based on the Lowland Dry ecosystem upon which they depend. Although the listing determination for *Bidens micrantha* ssp. *ctenophylla* is analyzed separately, native species that occur in the same ecosystems depend upon many of the same essential physical or biological features and the successful functioning of the ecosystem to survive. The species that share the same ecosystem also face a suite of common factors that may threaten them, and implementation of management actions for these threats benefits all the species found in the same managed area. In the 1984 and 2003 plant critical habitat designations, we targeted individual populations and some additional unoccupied habitat to provide for expansion of the populations and to meet recovery goals. Currently, our primary goal is to designate critical habitat occupied at the time of listing and that contains the physical and biological

features associated with the ecosystem on which each species depends and the unoccupied habitat in each ecosystem that is essential to reaching the numerical and habitat recovery goals for each species established in the recovery plans. Each critical habitat unit identified in this proposed rule contains the physical or biological features essential to the conservation of the species that occupy that particular unit, or areas essential for the conservation of those species that may not have occupied that unit at the time of listing. Where the unit is not occupied by a particular species, we believe it is still essential for the conservation of that species as it allows for the expansion of its range and reintroductions where the species occurred historically, and provides for recovery in the case of stochastic events that may eliminate the species from one or more locations where it is presently found.

Under ESA section 7, federal agencies and entities requiring a federal permit or authorization must ensure that their actions are not likely to destroy or adversely modify critical habitat after consultation with the Service. Thus, incremental economic impacts may be the direct compliance costs associated with additional effort for consultations, reinitiated consultations, and new consultations occurring specifically because of the designation of critical habitat, that would not have been required under the jeopardy standard. Incremental economic impacts may also occur if the federal action agency modifies its project or incorporates other measures either voluntarily to minimize effects to critical habitat or to comply with the statutory requirement of ensuring that it is not likely to destroy or adversely modify critical habitat.

Federal agencies are only required to modify the proposed action or take other measures to alleviate impacts if the proposed action is likely to destroy or adversely modify the designated critical habitat. While we do not currently have a regulatory definition of “destroy or adversely modify,” it generally means that an action would have to appreciably diminish the ability of the critical habitat network as a whole to perform its conservation function. In the Ninth Circuit, this analysis may only consider the conservation value of lands designated as critical habitat. *See Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service*, 378 F.3d 1059, 1075-76 (9th Cir. 2004). In most instances either no changes are necessary to meet this requirement or the federal agency modifies the project or incorporates other measures during the consultation process to avoid adversely modifying critical habitat. In light of *Gifford Pinchot*, such measures would need to occur in designated critical habitat, preferably in the unit being impacted. If, at the conclusion of consultation, the Service determines that the project is likely to destroy or adversely modify critical habitat as those terms are used in section 7, it will recommend reasonable and prudent alternatives that can be implemented consistent with the intended purpose of the action, the scope of the federal agency’s legal authority and jurisdiction, and that are economically and technologically feasible.

As discussed above, a federal project proponent is not required to modify the project or undertake other measures unless the project is determined through

formal consultation to be likely to destroy or adversely modify designated critical habitat. However, particularly because of critical habitat's conservation function, *see, e.g., id.* at 1070-71, PIFWO will often recommend measures to minimize impacts to critical habitat even when the proposed action does not reach the level of "destruction or adverse modification." Implementation of such measures is voluntary on the part of the federal action agency. If a project cannot be modified to reduce impacts to critical habitat, PIFWO will recommend conservation measures to minimize project impacts to designated critical habitat only in other areas of designated critical habitat, preferably in the unit being impacted. This would limit, for example, the areas which PIFWO would recommend a project proponent purchase, or establish a land conservation reserve, to offset project impacts.

Incremental impacts also may include indirect impacts resulting from reaction to the potential designation of critical habitat, triggering of additional requirements under State or local laws intended to protect sensitive habitat, and uncertainty and perceptual effects on markets.

Per your memo (*Guidance for Preparing an Incremental Effects Memo* dated November 3, 2010) to D. Krofta (see below, **QUESTIONS FROM IEC**) we provide the following information. In addition, we have already provided IEC the following:

1. GIS shapefiles of existing and proposed critical habitat, and areas under consideration for exclusion under section 4(b)(2). (11/1/2012)
2. Clean copy (Word document) of the proposed rule. (11/1/2012)
3. Hawaii Island section 7 consultation history 2007-2012 (TAILS report). (11-15-2012)
4. Big Island contact list (1/7/2013)
5. Zip file of existing and proposed critical habitat (1/7/2013)
6. Responses to questions from IEC (dated 12/19/2012) regarding Units 32 and 36 (1/7/2013)

QUESTIONS FROM IEC

CONSULTATION HISTORY FOR HAWAII ISLAND

We were able to query the TAILS database for the information requested below for the years 2007-2012. TAILS does not include information prior to 2007. This earlier information could be retrieved from paper records, stored in our archives. IEC agreed that, for now, the records prior to 2007 were not needed for their analysis because guidance provided prior to 2007 has been replaced by updated recommendations developed since that time.

- 1. Please provide us with the types/categories of projects or activities that you have provided technical assistance, informal consultations, and formal consultations with a Federal nexus on Hawaii Island.**

The types/categories of projects or activities that we have provided technical assistance or consulted on (for both the species and critical habitat), include: 570 projects - military training and infrastructure, geothermal leasing, alternative energy projects, airport development, air tour operations, highway construction and maintenance, housing/resort development, harbor construction, ungulate exclusion fencing, grazing and other agricultural activities, communications tower (new, replacement or upgrade), conservation and restoration projects, and fisheries operations.

2. Please identify the Federal agencies you consult with.

We consult internally within the Service and externally with the Department of Defense (DOD) Army, Navy, and Army National Guard; Federal Highways Administration (FHA); Department of Interior (DOI) National Park Service (NPS); U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA), and Animal Plant Health Inspection Services (APHIS); National Oceanic and Atmospheric Administration (NOAA) and NOAA-National Marine Fisheries Service (NMFS); U.S. Forest Service; Federal Emergency Management Administration (FEMA); U.S. Department of Energy (DOE); U.S. Environmental Protection Agency (EPA); U.S. Army Corps of Engineers (ACOE); U.S. Department of Housing and Urban Development (HUD); Federal Aviation Administration (FAA); Federal Communications Commission (FCC); U.S. Maritime Administration; and U.S. Coast Guard.

3. How frequently (percentage of total) do you consult with a particular Federal agency?

Between 2007 and 2012 we conducted a total of 12 formal consultations for listed species on the island of Hawaii. One internal (Service) formal consultation concerned effects of the issuance of enhancement of survival permits under section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended, for the Programmatic Safe Harbor Agreement for USDA Farm Bill Participants; three formal consultations concerned reinitiation of a 2003 biological opinion with the U.S. Army regarding training and facility construction at Pohakuloa Training Area; three formal consultations with the FCC concerned telecommunication towers; one formal consultation with FHA concerned re-alignment of Saddle Road; one formal consultation with NOAA concerned a restoration project in Pelekane Bay watershed; one formal consultation with NOAA-NMFS concerned the Hawaii longline fishery; and two formal consultations with the Service concerned Partners Program funding for restoration in Puu Pili and funding for feral cat trapping within critical habitat for the endangered forest bird, palila (*Loxioides bailleui*). For all 12 consultations, we

determined the projects were not likely to adversely affect existing critical habitat.

We conducted informal consultations with the following agencies: 23.6% (38 of 161) were conducted with USDA-NRCS, 12.4% (20 of 161) were conducted with FHA, 11.2% (18 of 161) were conducted with the FCC, 9.3% (15 of 161) were conducted with the Service, 6.8% (11 of 161) were conducted with the DOI-NPS, 3.7% (6 of 161) were conducted with the EPA, 2.5% (4 of 161) were conducted with the DOD-Army, 1.9% (3 of 161) were conducted with the HUD, 1.9% (3 of 161) were conducted with the FEMA, 1.9% (3 of 161) were conducted with the NOAA, 1.8% (3 of 161) were conducted with the DOD-Army National Guard, 1.2% (2 of 161) were conducted with the ACOE, 1.2% (2 of 161) were conducted with the DOD-Navy, 1.2% (2 of 161) were conducted with the DOE, 1.2% (2 of 161) were conducted with the FAA, 1.2% (2 of 161) were conducted with the U.S. Forest Service, 0.6% (1 of 161) were conducted with the USDA, 0.6% (1 of 161) were conducted with the USDA- FSA, 0.6% (1 of 161) were conducted with the U.S. Maritime Administration, 0.6% (1 of 161) were conducted with the U.S. Coast Guard, 0.6% (1 of 161) were conducted with the USDA-APHIS, and 13.7% (22 of 161) were conducted with non-Federal designees.

4. What type of project modifications do you request?

As discussed above, although project modifications are not required unless the proposed action is likely to jeopardize the species or adversely modify critical habitat, we typically recommend conservation measures to minimize the impacts to species and critical habitat during consultation, even for actions with effects not rising to the level of jeopardy or adverse modification. First and foremost, we request project modifications to avoid and minimize impacts to listed species and designated critical habitat. For example, we generally request the placement of project structures, access roads, and other associated infrastructure be planned to minimize soil disturbance and clearing of native vegetation, critical habitat, areas occupied by listed species, and native habitats. Measures should be taken to ensure invasive species are not spread to areas where they may impact listed species or critical habitat. Any increased threat of wildfire to listed species or their habitats should be minimized and measures to ensure any such areas burned are restored or impacts of fire to the species are offset should be incorporated into project plans. Noise from construction or operation that may adversely affect listed vertebrates should be avoided, especially during the breeding season. In addition, we make the following species-specific recommendations:

- Reduce ambient lights that inadvertently attract listed species such as sea turtles, or seabirds;
- Request project impacts such as construction should not occur during the nesting or breeding season for listed Hawaiian

waterbirds, Hawaiian hoary bat, Hawaiian hawk and Hawaiian goose;

- Establish buffer areas around sensitive species or critical habitat to reduce indirect effects of a project such as increased human use, lights, dust, etc.

OUTCOME OF SECTION 7 CONSULTATIONS IN UNOCCUPIED HABITAT

Unoccupied Habitat Included In the Proposed Designation

1. Does the designation include unoccupied habitat that was not previously subject to the requirements of section 7?

Each of the 7 proposed units is occupied by at least 1 of the 3 species for which critical habitat is proposed. In addition, one of the units (proposed critical habitat Hawaii—Lowland Dry—Unit 31) includes a portion of an existing plant critical habitat unit (Hawaii—Unit 10) that is occupied by one or more listed plant species. However, there may be portions of each occupied unit where no listed species occurs. Listed species may be scattered intermittently throughout the unit and/or clumped in portions of the unit. Therefore, there may be portions of each unit that were not previously subject to section 7 consultation because the species did not occur in the specific location of a proposed action.

(a) Identify unoccupied units or subunits.

Each of the 7 proposed units is considered occupied by at least 1 of the 3 species (Table 2). However, as stated above, there are portions of each occupied unit where no listed species may occur. Listed species may be scattered intermittently throughout the unit and/or may be clumped in portions of the unit.

(b) In areas considered to be occupied at a “population scale,” provide information about the likelihood that project proponents would have known about the potential presence of the species absent critical habitat.

Our office receives requests for comments on all development projects requiring Hawaii County permits. Our comment letters include a list of species known to occupy the proposed project site and we also recommend the project proponents conduct surveys to further assess the presence of listed species. Prior to coordinating with the County (and, prior to the County’s coordination with us), project proponents may be unaware of the presence of the species.

(c) Describe typical project modifications the Service will recommend when considering adverse modification. Provide recommendations applicable across a broad suite of projects, or if uncertain, provide range of potential outcomes.

Federal agencies and applicants are only required to avoid adverse effects to critical habitat that appreciably reduce the ability of the critical habitat system as a whole to perform its conservation function. However, the Service generally recommends that adverse impacts to critical habitat be avoided. Where critical habitat is temporarily impacted (for instance by project-related vegetation disturbance, wildfire, and non-native invasive species impacts), we would recommend measures to avoid or minimize the potential for introduction of nonnative species and to restore and conserve temporarily disturbed areas be incorporated into project plans. Where permanent impacts to critical habitat are unavoidable, we would recommend conservation measures to minimize habitat loss, preferably within the critical habitat unit. For example, the Service may recommend adverse impacts to critical habitat be minimized by restoring and conserving, in perpetuity, 2 or more acres of comparable habitat for every acre of habitat that is permanently removed. Our recommendation regarding the ratio of acres of habitat to be restored for each acre within the critical habitat that may be adversely impacted would depend on the severity of the impact, the type of habitat, the location of the habitat, the condition of the habitat to be impacted, how much of the habitat is needed for recovery and conservation of the species, and the rarity of the type of habitat being impacted. We would recommend that permanent impacts to rare habitat types in good condition be offset at higher ratios. Habitat that is already degraded could be offset with lower habitat conservation ratios if the quality of the habitat conserved is significantly greater than that of the habitat to be impacted. Typically recommended habitat restoration and protection actions for plant, invertebrate, and vertebrate species include propagation and outplanting of native plants, control of non-native invasive species (including rats, slugs, snails, and nonnative insects and fish), construction of ungulate fences and barriers and control of ungulates, and wildfire threat minimization.

To avoid adverse modification, the Service may recommend similar measures; however, the habitat conserved should be within the affected critical habitat unit, or, where that is not possible, be within the critical habitat of the ecosystem type to be impacted.

OUTCOME OF SECTION 7 CONSULTATIONS IN OCCUPIED HABITAT

- 2. Once critical habitat is designated, will the outcome of section 7 consultations in occupied habitat be different?**
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The Service's recommendations for minimizing adverse project impacts to habitat that is occupied by a listed bird or bat, invertebrate, or plant species under the jeopardy standard are often the same as recommendations we would make to minimize adverse impacts to critical habitat with the exception of the conservation project's location. While the standards of jeopardy and adverse modification are different, both include a concern for effects to recovery to some degree. Our recommendations for discretionary conservation measures are often similar under both standards because they are generally focused on minimizing project effects to habitat to support the conservation of the listed species and because the habitat requirements of the listed species in this area (such as other listed plant species, Blackburn's sphinx moth, Hawaiian hawk or 'io (*Buteo solitarius*), or Hawaiian hoary bat or 'ope'ape'a (*Lasiurus cinereus*) are often very similar (e.g., native vegetation) to the physical and biological features identified in critical habitat. For example, the habitat requirements for other listed plants in the lowland dry ecosystem (the type of habitat in which critical habitat is proposed) are identical to or similar to the physical or biological features that are essential to the conservation of the three plant species for which critical habitat is proposed. These physical or biological features include native canopy plants such as lama (*Diospyros sandwicensis*), wiliwili (*Erythrina sandwicensis*) and 'ohi'a (*Metrosideros polymorpha*) and understory plants such as 'a'ali'i (*Dodonaea viscosa*) and 'ulei (*Osteomeles anthyllidifolia*). Thus, actions to promote native habitats that support listed species will also be beneficial in establishing and providing the ecosystems that support the canopy and understory plant species identified as the physical or biological features essential for the conservation of *Bidens micrantha* ssp. *ctenophylla*, *Isodendrion pyriformium*, and *Mezoneuron kavaiense* (for which critical habitat is proposed).

In instances where a conservation project is developed to minimize adverse project impacts to a species at a particular site, the conservation project that most benefits that species may not be within the critical habitat unit to be impacted by the project. In contrast, to minimize the adverse impacts to a critical habitat unit, we would recommend the conservation project be located within the same unit of critical habitat the project is impacting or at least should be in a critical habitat unit that provides the same conservation benefit as the unit to be impacted.

(a) What laws, conservation plans, or policies currently provide protection to the species and their habitat?

Laws

Endangered Species Act of 1973, as amended (ESA)

Hawaii Revised Statute 195-D (Haw. Rev. Stat. 195-D). Currently, Hawaii's Department of Land and Natural Resources (DLNR) administers the Conservation of Aquatic Life, Wildlife, and Land Plants Act Endangered and Threatened Species (Haw. Rev. Stat. 195-D), through Hawaii Administrative Rules, Title 13, Subtitle 5, Chapter 107, Threatened and Endangered Plants; and Chapter 124, Indigenous Wildlife, Endangered and Threatened Wildlife, and Introduced Wild Birds. This law is Hawaii's endangered species act, and incorporates the list of endangered and threatened species under the Federal ESA. The DLNR is authorized to add other indigenous Hawaiian species to the established list of state endangered and threatened species. Unlike the Federal ESA, Hawaii State law recognizes "take" for plants. The Hawaii statute makes it unlawful for any person to take, possess, transport, or sell any species on either the Federal or State list. However, **pursuant to Haw. Rev. Stat. 195D, a landowner may seek an Incidental Take License (ITL) from the DLNR for take of a threatened or endangered species that is incidental to an otherwise lawful activity provided that the applicant prepares an accompanying State Habitat Conservation Plan (HCP) that meets the requirements enumerated under Haw. Rev. Stat. 195D including measures for avoidance, minimization, mitigation, monitoring, and net recovery benefit to the affected species.**

Conservation Plans

Federal Agencies

The Fish and Wildlife Service Recovery Plans—While not regulatory documents, the Service's recovery plans for listed species describe conservation strategies and those measures that can be implemented to recover the species. Recovery plans are in place for the two listed plant species (*Isodendron pyrifolium* and *Mezoneuron kavaiense*) included in the Hawaii Island proposed rule, and will be in development for 15 plant and animal species if listed endangered or threatened in the Hawaii Island final rule. Recovery actions may include, but are not limited to: collection, propagation, and maintenance of genetic stock; protection of remaining wild individuals, identification and mapping of all extant wild populations; delineation of management units, provision for long-term habitat protection by fencing, ungulate control, nonnative plant control, rodent control, and wildfire control; control of nonnative wasps and ants; prevention of human disturbance; outplanting in prepared and protected sites; study of pollination limitations, disease vectors, and reproductive viability; and development of a long-term monitoring program using adaptive management methods. These actions are carried out by a collection of agencies, land managers and owners. Service recovery plans can be accessed online at: <http://www.fws.gov/endangered/species/recovery-plans.html>.

The National Park Service Management Plans—Proposed critical habitat in Hawaii—Lowland Dry—Unit 36 overlaps with Kaloko-Honokohau National Historical Park. The management plans for this national park can be accessed online at: <http://www.nps.gov/kaho/parkmgmt/planning.htm>

State of Hawaii Agencies

The Hawaii State Forest Reserve System—Proposed critical habitat in Hawaii—Lowland Dry—Unit 31 overlaps with one of the 22 forest reserves on the island of Hawaii, Puu Waa Waa Forest Reserve. Management goals for the forest reserve may be accessed online at: <http://www.state.hi.us/dlnr/dofaw/frs>. Management plans for this forest reserve may be available online or by contacting the district forestry office in Hilo (808/974-4221).

Hawaii Wildlife Conservation Strategy—Hawaii’s Comprehensive Wildlife Conservation Strategy (CWCS) presents strategies for long-term conservation of Hawaii’s native species and their habitats. The CWCS builds on and synthesizes information gathered from existing conservation partnerships and cooperative efforts, to develop a strategy that is based on collaboration with other local, State, and Federal agencies, non-governmental organizations, private landowners, and interested citizens. To address the major threats facing Hawaii’s native wildlife and plants, the CWCS identifies multiple strategies to implement seven priority conservation objectives for the State. The CWCS can be accessed online at: <http://www.state.hi.us/dlnr/dofaw/cwcs>.

Private Organizations and Partnerships

Kaloko Makai Dryland Forest Preserve (154 acres)—Restoration efforts began in this preserve in 2011 by Hawaii Forest Institute. The preserve was set up to offset impacts to native species and habitat by construction of the Ane Keohokalole Highway. Other partners involved in the restoration efforts include the Service, Hawaii County Department of Public Works, FHA, and landowners Stanford Carr Developments and Lanihau Properties. The preserve is within the 630 acres being considered for exclusion (for the Kaloko Makai Development) in Hawaii—Lowland Dry—Unit 34. Information on this preserve can be accessed online at: <http://www.hawaiiforestinstitute.org/our-projects/dryland-forest-projects/kaloko-makai-dryland>.

Kaupulehu Dryland Forest Site—A partnership of the Dryland Forest Working Group, landowners, non-profits, government agencies, and others are restoring remnant dryland forests in Kaupulehu and nearby properties. Information on this site can be accessed online at: <http://www.hawaiiforestinstitute.org/our-projects/dryland-forest-projects/kaupulehu-dryland>. Information on a 70 acre Kaupulehu Dryland

Forest Preserve that has been protected with an ungulate enclosure fence can be accessed online at: <http://www.drylandforest.org>. This 70 acre preserve is within the 2,834 acres being considered for exclusion (for Kamehameha Schools) in Hawaii—Lowland Dry—Unit 31.

Palamanui Global Holdings, LLC lands at Kau—Palamanui is involved in several voluntary partnerships and carrying out species' conservation activities on their lands in north Kona. They are a member of the North Kona Dry Forest Working Group and they have partnered with the Hawaii Permanent Plot Network (HIPNET) to establish a 10-acre plot to measure and monitor forest dynamics in the lowland dry ecosystem. In addition, they have drafted a 10-year management plan for an approximately 60-acre area that has been fenced to exclude nonnative ungulates. The plan includes management of threats such as wildlife, nonnative plant species, and rodents. There are 502 acres of Palamanui Global Holdings, LLC lands being considered for exclusion in Hawaii—Lowland Dry—Unit 33.

La'i 'Opua Preserve—Hawaii Forest Institute is working with Hawaii Forest Industry Association, Hawaii Department of Hawaiian Homelands (DHHL), and other community partners to restore and manage 4 separate plant preserves that together total 70 acres at the Villages of La'i 'Opua. The four separate preserves are not within the 87 acres of DHHL lands that are being considered for exclusion in Hawaii—Lowland Dry—Unit 35 because of the history of bulldozer activity in the preserves. DHHL is involved in conservation actions to promote the conservation of rare and endangered species, including funding for the aforementioned preserves, fencing to exclude nonnative feral ungulates, removing nonnative plants, and promoting community volunteer programs that support native plant conservation. Information on this site can be accessed online at: <http://www.hawaiiforestinstitute.org/our-projects/dryland-forest-projects/laiopua>. We have been contacted by Mr. Bo Kahui, Executive Director La'i'opua 2020 (bokahui@yahoo.com) who has expressed concern regarding his project at La'i 'Opua and the overlying proposed critical habitat.

Federally Funded Conservation Actions

The Pacific Islands Fish and Wildlife Office's Conservation Partnerships Program—This program is a collection of voluntary habitat restoration programs (Partners for Fish and Wildlife, Coastal Conservation Program, Invasive Species Program, and Environmental Contaminants Program) with the goal of restoring native Pacific Island ecosystems through collaborative projects. The program seeks to implement large-scale conservation efforts for the benefit of native ecosystems by working cooperatively with private landowners, conservation organizations,

community groups, and other government agencies. Assistance provided by the Service ranges from informal advice on the potential restoration project design and location to cost-share funding of project implementation under a formal cooperative agreement with the landowner. Funding is limited and highest priority projects are those that reestablish natural biological communities and provide long-term benefits to listed (endangered or threatened), proposed or candidate species; declining migratory bird and fish species; and private lands projects that satisfy the needs of wildlife populations on National Wildlife Refuges. Information on the Pacific Islands Partners for Fish and Wildlife Program can be accessed online at: <http://www.fws.gov/pacificislands/partners.html>.

U.S.D.A. - NRCS—The Environmental Quality Incentives Program (EQIP) is a voluntary program that provides financial and technical assistance through contracts up to a maximum of 10 years. The contracts provide financial assistance to help plan and implement conservation practices that address natural resource concerns and provide opportunities to improve soil, water, plant and animal resources on agricultural land and nonindustrial private forest land. The Wildlife Incentives Program (WHIP) is a voluntary program for conservation-minded landowners who wish to develop and improve wildlife habitat on agricultural land, nonindustrial private forest land, and tribal land. Information on these two programs in Hawaii can be accessed online at: <http://www.pia.nrcs.usda.gov/programs>.

U.S. Forest Service—The Forest Service provides funding for private and government entities in Hawaii for issues pertaining to 1) water quality and quantity, 2) forest health: invasive species, insects, and disease, 3) wildfire prevention and suppression, 4) urban forest health and sustainability, 5) climate change/sea level rise, 6) conservation of native biodiversity, 7) hunting, nature-based recreation and tourism, and 9) regional issues specific to the Pacific Islands. Information on their programs in Hawaii can be accessed online at: <http://www.fs.fed.us/psw/hawaii>.

Other State and Privately-Funded Conservation Actions

Watershed Partnerships—The Hawaii Association of Watershed Partnerships is comprised of 9 island-based watershed partnerships that work collaboratively with more than 70 public and private partners on six islands, including the island of Hawaii, to protect over 2.2 million acres of forested watershed lands. On the island of Hawaii there are three watershed partnerships: Three Mountain Alliance, Mauna Kea Watershed, and Kohala Watershed Partnership. Information on these partnerships can be accessed online at: <http://hawp.org>.

Hawaii Invasive Species Council—This council was established to provide policy level direction, coordination, and planning among Hawaii's

government departments, Federal agencies, and international and local initiatives for the control and eradication of harmful invasive species throughout the state and to prevent the introduction of other invasive species that may be potentially harmful. Further information can be accessed online at: <http://www.hawaiiinvasivespecies.org>.

Big Island Invasive Species Committee—This committee is part of an island-based partnership of government agencies, non-government organizations, and private businesses working to protect this island from the most threatening invasive pests. The committee has a paid staff and field crew to implement rapid response and control plans. Further information can be accessed online at: <http://www.hawaiiinvasivespecies.org/iscs>.

(b) What types of project modifications are currently recommended by the Service to avoid jeopardy?

Project modifications currently recommended by our office to avoid jeopardy to **listed plants** may include a combination of any of the following:

- (1) Actions to avoid destruction of individual listed plants.
- (2) Actions to control feral ungulates (e.g., pigs (*Sus scrofa*), sheep (*Ovis aries*), mouflon sheep (*Ovis gmelini musimon*), goats (*Capra hircus*), and cattle (*Bos taurus*)).
- (3) Actions to control nonnative plants.
- (4) Actions to control seed predators such as rats.
- (5) Actions to control nonnative invertebrates (e.g., slugs).
- (6) Actions to control wildfire.
- (7) Actions to avoid destruction of habitat for listed plants.
- (8) Actions to offset destruction of listed plants including propagating, outplanting and conserving the plants elsewhere such that no net reduction to the species' range or numbers results from the project.

(c) What recommendations will the Service make during a section 7 consultation that considers both jeopardy and adverse modification?

Most projects that we consult on for effects to listed species involve impacts to habitat; very rarely are the impacts non-habitat based. Because most of the effects we assess are from impacts to habitat, project modifications that our office may recommend during a section 7 consultation on critical habitat would include similar but not necessarily the same habitat-based measures as for a consultation on the species, except that we would recommend such measures to minimize adverse modification to critical habitat be located in similar critical habitat (preferably in the impacted unit). In contrast, to minimize effects to the

species, the measures need not be within the critical habitat unit, but could be elsewhere.

BEHAVIOR CHANGES AS A RESULT OF NEW INFORMATION

Will the designation provide new information to stakeholders that results in different behavior [i.e., will the designation compel stakeholders to consult with us where not otherwise required]?

In a subset of areas, the designation will compel Federal agencies to consult with us pursuant to section 7, where it would not otherwise be required. The subset of areas where Federal agencies would now consult, where it would not have been required in the absence of the critical habitat designation, are those where listed species, such as other listed plants, the Hawaiian hoary bat, or the Blackburn's sphinx moth, are not currently present and critical habitat was previously absent. This is likely a small area because, for example, the Blackburn's sphinx moth's historical range overlaps with all of the proposed critical habitat units, although surveys would need to be conducted in proposed project action areas to determine whether or not the species currently occurs in a specific location. In addition, there is substantial overlap of the proposed critical habitat with the historical range of other listed plants. At a minimum, Federal agencies would need to survey for the presence of listed plants within proposed project action areas. Therefore, the designation of new critical habitat (i.e., critical habitat proposed in the Hawaii Island rule) would not typically result in a different behavior. Federal agencies already are surveying for currently listed species over much of the proposed critical habitat. However, as discussed previously (see 1. (c)) the presence of critical habitat may change the design of the conservation actions used to minimize adverse project impacts in that the future projects may be completed within the critical habitat unit, rather than elsewhere.

(a) Are Federal agencies (Action agencies) or project proponents more likely to consult under section 7 or to pursue habitat conservation plans (HCPs) under section 10 after the designation of critical habitat? Describe actions taken by stakeholders as a result of critical habitat

Action agencies will likely have more actions that may affect critical habitat after the designation than they did prior to the critical habitat designation and, therefore, will need to consult more. These additional actions are only in areas where critical habitat was not previously designated or where listed species are not currently present.

As there is no take prohibition related to critical habitat, we do not expect non-federal project proponents to pursue HCPs solely because of newly designated critical habitat.

(b) Will local land use or resource agencies view designated critical habitat differently when making permitting or other decisions? Describe how local land agencies might change project requirements

We are not aware if local land use or resource agencies view designated critical habitat differently when making permitting or other decisions. We are not aware of any additional “requirements” pursuant to State law (Hawaii Revised Statue 195-D) that would be triggered due to designation of critical habitat. Although the Hawaii Department of Land and Natural Resources may initiate amendments to conservation districts to include habitat of rare native species we do not know how frequently such amendments have ever been initiated or finalized. We work jointly with the State’s Division of Fish and Wildlife (DOFAW) and applicants to develop HCPs pursuant to both Federal and State laws. The Service and DOFAW process the State and Federal HCPs concurrently working collaboratively to come to a consensus regarding the estimated take and the mitigation to offset that take. The end result is that the final State HCP and the Federal HCP are often very similar documents. This assists both agencies in monitoring the actions and the mitigation of the HCPs. Therefore, if the Service requests additional land to be conserved to offset impacts to critical habitat, that mitigation will be the same in the State HCP.

CHANGES IN ADMINISTRATIVE EFFORT

4. How much additional administrative effort will the Service expend to address adverse modification in its section 7 consultations? How great will the increase in effort be on average? Describe the increase in administrative effort [i.e., number of hours] on average in absolute terms or as a percentage of current effort.

Addressing adverse modification of critical habitat in our section 7 consultations will not increase our administrative effort in approximately **99.9%** of our consultations. This is because many consultations occur in areas that are already designated critical habitat for species not subject to the current proposed rule or are occupied by listed species and measures to minimize adverse project impacts to avoid jeopardy or adverse modification may already be incorporated into the project in the absence of the Hawaii Island designation. To address those instances where additional or different conservation measures are needed, the workload would increase by approximately **0.1%**.

CHANGES IN STATE OR LOCAL LAWS

5. Does the designation of critical habitat trigger additional “requirements” (i.e., project modifications) under State or local laws to protect sensitive habitat?

We are not aware of any additional “requirements” pursuant to State law (Hawaii Revised Statue 195-D) that would be triggered due to designation of critical habitat. Although the Hawaii Department of Land and Natural Resources may initiate amendments to conservation districts to include habitat of rare native species we do not know how frequently such amendments have ever been initiated or finalized.

MITIGATION IN EXISTING CRITICAL HABITAT

6. Is there already (absent the new critical habitat designation for the three Hawaii Island species) mitigation recommended to offset disturbance from development activities in the existing critical habitat areas?

Yes

7. If so, is that mitigation in existing critical habitat recommended at similar ratios as would be for the three Hawaii Island species?

Yes.

8. Would additional critical habitat in those areas (for the Hawaii Island species) change the recommended mitigation ratios?

No. The designation of additional critical habitat in areas that are already critical habitat would not change the recommended mitigation ratios.

9. Is mitigation for disturbance in existing critical habitat recommended to be implemented within those existing critical habitat units?

Yes, we would recommend any habitat conservation measures be implemented within the critical habitat unit being impacted by the proposed action. If this is impossible, habitat conservation measures should at least be within nearby critical habitat units that provide the same conservation value as the impacted unit.

TABLE 1. THE HAWAII ISLAND SPECIES ADDRESSED IN THE PROPOSED RULE (“PE” DENOTES PROPOSED ENDANGERED AND “E” DENOTES ENDANGERED STATUS UNDER THE ACT			
Species proposed for listing as endangered			
Plants			
Scientific name	Common Name(s)	Listing Status	Critical Habitat Status
<i>Bidens hillebrandiana</i> ssp. <i>hillebrandiana</i>	Kookoolau	Proposed–Endangered	Not determinable
<i>Bidens micrantha</i> ssp. <i>ctenophylla</i>	Kookoolau	Proposed–Endangered	Proposed
<i>Cyanea marksii</i>	Haha	Proposed–Endangered	Not determinable
<i>Cyanea tritomantha</i>	Aku	Proposed–Endangered	Not determinable
<i>Cyrtandra nanawaleensis</i>	Haiwale	Proposed–Endangered	Not determinable
<i>Cyrtandra wagneri</i>	Haiwale	Proposed–Endangered	Not determinable
<i>Phyllostegia floribunda</i>	No common name [NCN]	Proposed–Endangered	Not determinable
<i>Pittosporum hawaiiense</i>	Hoawa, haawa	Proposed–Endangered	Not determinable
<i>Platydesma remyi</i>	NCN	Proposed–Endangered	Not determinable
<i>Pritchardia lanigera</i>	Loulu	Proposed–Endangered	Not determinable
<i>Schiedea diffusa</i> ssp. <i>macraei</i>	[NCN]	Proposed–Endangered	Not determinable
<i>Schiedea hawaiiensis</i>	[NCN]	Proposed–Endangered	Not determinable
<i>Stenogyne cranwelliae</i>	[NCN]	Proposed–Endangered	Not determinable
Animals			
<i>Drosophila digressa</i>	Picture-wing fly	Proposed–Endangered	Not determinable
<i>Vetericaris chaceorum</i>	Anchialine pool shrimp	Proposed–Endangered	Not determinable
Listed species with proposed taxonomic revision & without critical habitat designation			

<i>Caesalpinia kawaiiense</i> (taxonomic revision proposed, to <i>Mezoneuron kawaiiense</i>)	Uhiuhi	Listed 1986-E	Proposed
Listed species without critical habitat designation on Hawaii Island			
Scientific name	Common Name(s)	Listing Status	Status of Existing Critical Habitat
<i>Isodendrion pyriformium</i>	Wahine noho kula	Listed 1994-E	Proposed

TABLE 2. HAWAII ISLAND TABLE OF SPECIES OCCUPIED/UNOCCUPIED BY UNIT		
Unit name	Species occupied	Species unoccupied*
Hawaii 10– <i>Bidens micrantha</i> ssp. <i>ctenophylla</i> –a		X
Hawaii 10– <i>Isodendrion pyriformium</i> –a		X
Hawaii 10– <i>Mezoneuron kawaiiense</i> –a	X	
Hawaii 31– <i>Bidens micrantha</i> ssp. <i>ctenophylla</i> –b	X	
Hawaii 31– <i>Isodendrion pyriformium</i> –b		X
Hawaii 31– <i>Mezoneuron kawaiiense</i> –b	X	
Hawaii 32– <i>Bidens micrantha</i> ssp. <i>ctenophylla</i> –c		X
Hawaii 32– <i>Isodendrion pyriformium</i> –c		X
Hawaii 32– <i>Mezoneuron kawaiiense</i> –c	X	
Hawaii 33– <i>Bidens micrantha</i> ssp. <i>ctenophylla</i> –d		X
Hawaii 33– <i>Isodendrion pyriformium</i> –d		X
Hawaii 33– <i>Mezoneuron kawaiiense</i> –d	X	
Hawaii 34– <i>Bidens micrantha</i> ssp. <i>ctenophylla</i> –e	X	
Hawaii 34– <i>Isodendrion pyriformium</i> –e		X

Hawaii 34– <i>Mezoneuron kavaiense</i> –e	X	
Hawaii 35– <i>Bidens micrantha</i> ssp. <i>ctenophylla</i> –f	X	
Unit name	Species occupied	Species unoccupied*
Hawaii 35– <i>Isodendrion pyriformium</i> –f	X	
Hawaii 36– <i>Bidens micrantha</i> ssp. <i>ctenophylla</i> –g	X	
Hawaii 36– <i>Isodendrion pyriformium</i> –g		X

*Unoccupied by the listed and/or proposed plant for which the unit is proposed critical habitat.