

## Table of Contents

<b>Finding of No Significant Impact .....</b>	<b>iii</b>
<b>Readers’ Guide.....</b>	<b>xv</b>
<b>Chapter 1. Introduction and Background .....</b>	<b>1-1</b>
1.1 Introduction.....	1-1
1.2 Significance of the Refuge.....	1-1
1.3 Proposed Action.....	1-2
1.4 Purpose and Need for Action.....	1-7
1.5 Legal and Policy Guidance .....	1-7
1.5.1 The U.S. Fish and Wildlife Service .....	1-7
1.5.2 National Wildlife Refuge System .....	1-7
1.5.3 Other Laws and Mandates.....	1-9
1.6 Refuge Establishment and Purposes.....	1-10
1.6.1 Legal Significance of the Refuge Purpose(s).....	1-10
1.6.2 Purpose and History of Refuge Establishment .....	1-10
1.6.3 Land Status and Ownership .....	1-11
1.7 Relationship to Other Planning Efforts.....	1-17
1.7.1 Relationship to Refuge Plans .....	1-17
1.7.2 Other Plans and Assessments.....	1-18
1.8 Special Designation Lands.....	1-22
1.8.1 Important Bird Areas (IBA).....	1-22
1.8.2 National Register of Historic Places .....	1-22
1.9 Planning Process and Issue Identification .....	1-23
1.9.1 Planning Process .....	1-23
1.9.2 Key Issues Addressed in the CCP.....	1-24
1.9.3 Issues Outside the Scope of the CCP .....	1-24
1.10 Refuge Vision and Goals .....	1-24
1.10.1 He nu‘ukia no ka pu‘uhonua (Refuge Vision).....	1-24
1.10.2 ‘O nā pahuhopu o ka pu‘uhonua (Refuge Goals) .....	1-25
1.11 References.....	1-26
<b>Chapter 2. Management Direction.....</b>	<b>2-1</b>
2.1 Overview.....	2-1
2.2 Management Directions Considered but not Developed .....	2-1
2.3 Description of Management Direction .....	2-2
2.4 Goals, Objectives, and Strategies .....	2-18
2.4.1 Goal 1: Protect, enhance, and manage the coastal ecosystem to meet the life-history needs of migratory seabirds and threatened and endangered species. ....	2-19
2.4.2 Goal 2: Restore and/or enhance and manage populations of migratory seabirds and threatened and endangered species. ....	2-25
2.4.3 Goal 3: Gather scientific information (surveys, research, and assessments) to support adaptive management decisions.....	2-28

2.4.4	Goal 4: Ensure that visitors and kama‘āina of all ages and abilities feel welcome, enjoy a safe visit, and are provided high-quality opportunities for wildlife-dependent recreation which allows them to connect with, while having limited impacts to, the wildlife, habitats, and cultural and historic richness of the Refuge.....	2-31
2.4.5	Goal 5: Identify, protect, evaluate, and interpret the cultural (including historic) resources and heritage of the Refuge while consulting with Native Hawaiian organizations and preservation partners and complying with historic preservation legislation.....	2-49
2.4.6	Goal 6: Ensure that all visitors enjoy safe and well-maintained operations that contribute to a positive visitor experience. ....	2-50
2.5	References.....	2-53
<b>Chapter 3. Physical Environment .....</b>		<b>3-1</b>
3.1	Climate.....	3-1
3.1.1	General Climate .....	3-1
3.1.2	Climate Change.....	3-3
3.2	Hydrology .....	3-8
3.3	Topography and Bathymetry .....	3-9
3.4	Geology and Geomorphology.....	3-10
3.5	Soils .....	3-10
3.6	Fire.....	3-11
3.7	Environmental Contaminants .....	3-11
3.8	Air Quality .....	3-12
3.9	Water Quality.....	3-13
3.10	Visual Quality.....	3-13
3.11	Surrounding Land Uses .....	3-14
3.12	References.....	3-15
<b>Chapter 4. Refuge Biology and Habitats .....</b>		<b>4-1</b>
4.1	Biological Integrity, Diversity, and Environmental Health.....	4-1
4.2	Priority Resources of Concern.....	4-4
4.2.1	Analysis of Resources of Concern.....	4-4
4.2.2	Selection of Priority Resources of Concern.....	4-4
4.3	Primary Habitats .....	4-9
4.3.1	Coastal Mixed Woodland-Grassland .....	4-13
4.3.2	Cliff.....	4-13
4.3.3	Beach Strand .....	4-13
4.4	Threatened and Endangered and Other Native Wildlife.....	4-14
4.4.1	‘A‘o ( <i>Puffinus auricularis newelli</i> ) or Newell’s Shearwater .....	4-14
4.4.2	Nēnē ( <i>Branta sandvicensis</i> ) or Hawaiian Goose .....	4-14
4.4.3	‘Ōpe‘ape‘a ( <i>Lasiurus cinereus semotus</i> ) or Hawaiian hoary bat.....	4-16
4.4.4	‘Ilio-holo-i-ka-uaua ( <i>Monachus schauinslandi</i> ) or Hawaiian monk seal .....	4-16
4.4.5	Pueo ( <i>Asio flammeus sandwichensis</i> ) or Hawaiian Short-eared Owl .....	4-17
4.4.6	Honu ( <i>Chelonia mydas</i> ) or Green Turtle .....	4-18
4.5	Breeding Seabirds.....	4-19
4.5.1	Mōlī ( <i>Phoebastria immutabilis</i> ) or Laysan Albatross .....	4-19
4.5.2	‘Ua‘u kani ( <i>Puffinus pacificus</i> ) or Wedge-tailed Shearwater .....	4-20

4.5.3 Koa‘e kea ( <i>Phaethon lepturus</i> ) or White-tailed Tropicbird	4-21
4.5.4 Koa‘e ‘ula ( <i>Phaethon rubricauda</i> ) or Red-tailed Tropicbird	4-22
4.5.5 ‘Ā ( <i>Sula sula</i> ) or Red-footed Booby	4-23
4.6 Other Seabirds	4-24
4.7 Migratory Waterfowl and Shorebirds	4-25
4.8 Threatened and Endangered Plants	4-26
4.8.1 Pokulakalaka ( <i>Munroidendron racemosum</i> )	4-26
4.8.2 Alula ( <i>Brighamia insignis</i> )	4-27
4.8.3 Dwarf Naupaka ( <i>Scaevola coriacea</i> )	4-27
4.8.4 Lo‘ulu ( <i>Pritchardia aylmer-robinsonii</i> )	4-27
4.8.5 Lo‘ulu ( <i>P. napaliensis</i> )	4-28
4.9 Native Plant Communities	4-28
4.9.1 Naupaka Kahakai ( <i>Scaevola sericea</i> ) or Beach Naupaka	4-29
4.9.2 ‘Ilima ( <i>Sida fallax</i> ) or Yellow Ilima	4-29
4.9.3 Hala ( <i>Pandanus tectorius</i> ) or Screw pine	4-29
4.9.4 ‘Akoko ( <i>Chamaesyce celastroides</i> )	4-30
4.9.5 Pōhinahina ( <i>Vitex rotundifolia</i> )	4-30
4.10 Invasive Species	4-30
4.10.1 Mammals	4-31
4.10.2 Birds	4-34
4.10.3 Amphibians	4-35
4.10.4 Invertebrates	4-36
4.10.5 Plants	4-36
4.11 References	4-40
<b>Chapter 5. Social and Economic Environment</b>	<b>5-1</b>
5.1 Cultural Resources	5-1
5.1.1 Introduction	5-1
5.1.2 Kīlauea Point NWR	5-2
5.2 Refuge Facilities	5-7
5.3 Public Use Overview	5-11
5.3.1 Visitation Trends	5-11
5.3.2 Volunteer Program	5-13
5.3.3 Visitation and Visitor Experience	5-15
5.3.4 Visitor Services Management Challenges	5-18
5.4 Wildlife-Dependent Public Uses	5-22
5.4.1 Hunting	5-22
5.4.2 Fishing	5-22
5.4.3 Wildlife Observation and Photography	5-23
5.4.4 Environmental Education	5-23
5.4.5 Interpretation/Outreach	5-25
5.4.6 Cultural Resources Interpretation	5-26
5.5 Other Refuge Uses	5-26
5.6 Illegal Uses	5-26
5.7 Area Outdoor Recreational Opportunities and Trends	5-27
5.7.1 Nearby Recreational Opportunities	5-27

5.7.2 Outdoor Recreation Rates and Trends ..... 5-28

5.8 Social/Economic Environment ..... 5-33

5.8.1 Population, Housing, and Income ..... 5-35

5.8.2 Employment and Business ..... 5-37

5.8.3 Refuge Impact on Local Economies ..... 5-40

5.8.4 Additional Economic Contributions ..... 5-40

5.9 References ..... 5-41

**Appendices**

Appendix A. Appropriate Use Findings ..... A-1

Appendix B. Compatibility Determinations ..... B-1

Appendix C. Implementation ..... C-1

Appendix D. Wilderness Review for Kīlauea Point National Wildlife Refuge ..... D-1

Appendix E. Biological Resources of Concern ..... E-1

Appendix F. Statement of Compliance ..... F-1

Appendix G. Integrated Pest Management (IPM) ..... G-1

Appendix H. Common Acronyms and Abbreviations ..... H-1

Appendix I. CCP Team Members and Public Involvement ..... I-1

Appendix J. Kīlauea Point NWR Species Lists ..... J-1

Appendix K. Public Comments and Service Responses ..... K-1

**Figures**

Figure 1-1. Regional Area, Kaua‘i County ..... 1-3

Figure 1-2. Local Area, Kīlauea Point NWR, Kaua‘i County ..... 1-5

Figure 1-3. Land Status, Kīlauea Point NWR ..... 1-15

Figure 2-1. Management Direction for Wildlife and Habitat Management, Kīlauea Point NWR.2-57

Figure 2-2. Management Direction for Public Use and Maintenance/Facilities, Kīlauea Point NWR. .... 2-59

Figure 3-1. Kīlauea Assets Map (County of Kaua‘i 2006). ..... 3-14

Figure 4-1. Overview of the process to prioritize resources of concern and management priorities for a refuge (USFWS 2010) ..... 4-6

Figure 4-2. Habitat, Kīlauea Point NWR. .... 4-11

Figure 4-3. Nēnē reproduction at Kīlauea Point NWR, 2005–2011 ..... 4-16

Figure 4-4. Mōlī reproduction at Kīlauea Point NWR, 2002–2012. .... 4-20

Figure 5-1. Public Use and Maintenance and Facilities, Kīlauea Point NWR. .... 5-9

Figure 5-2. Monthly visitation to Kaua‘i and Kīlauea Point NWR (USFWS unpublished data).5-12

Figure 5-3. Likelihood of visiting Kīlauea Point NWR versus management options (Parsons Brinckerhoff 2006). ..... 5-18

Figure 5-4. Percentage of visitors from the western U.S. participating in certain recreation activities on Kaua‘i over time.<sup>1</sup> ..... 5-30

Figure 5-5. Percentage of visitors from the eastern United States participating in certain recreation activities on Kaua‘i over time. .... 5-31

Figure 5-6. Percentage of visitors from Japan participating in certain recreation activities on Kaua‘i over time. .... 5-32

Figure D-1. Land Status, Kīlauea NWR. .... D-7  
 Figure K-1. Easements on Crater Hill, Kīlauea Point NWR. .... K-33

**Tables**

Table 2-1 Summary of Management Direction. .... 2-11  
 Table 4-1. Biological Integrity, Diversity, and Environmental Health..... 4-2  
 Table 4-2. Priority Resources of Concern..... 4-8  
 Table 4-3. Spring surveys of ‘ā breeding pairs, Kīlauea Point NWR (USFWS files)..... 4-24  
 Table 4-4. Shorebirds of primary conservation importance in the Pacific islands region (Engilis and Naughton 2004). .... 4-25  
 Table 5-1. Number of areas providing specific recreation activities on Kaua‘i. .... 5-28  
 Table 5-2. Number of people participating in wildlife-related recreation in Hawai‘i over time... 5-29  
 Table 5-3. County and state population estimates. .... 5-36  
 Table 5-4. State and county income, unemployment, and poverty statistics, 2011..... 5-37  
 Table 5-5. Full-time employment by sector, 2011, Kaua‘i County. .... 5-39  
 Table B-1. Summary of Compatibility Determinations..... B-1  
 Table C-1. One-time Costs (in Thousands). .... C-3  
 Table C-2. Operational (Recurring) Costs (Annual in Thousands). .... C-8  
 Table E-1. Kaua‘i National Wildlife Refuge Complex comprehensive resources of concern. .... E-2  
 Table E-2. Kīlauea Point NWR priority resources of concern. .... E-7  
 Table G-1. Ecotoxicity Tests Used to Evaluate Potential Effects to Birds, Fish, and Mammals to Establish Toxicity Endpoints for Risk Quotient Calculations ..... G-17  
 Table G-2. Presumption of Unacceptable Risk for Birds, Fish, and Mammals (USEPA 1998) .. G-18  
 Table G-3. Average Body Weight of Selected Terrestrial Wildlife Species Frequently Used in Research to Establish Toxicological Endpoints (Dunning 1984)..... G-19  
 Table I-1. List of Preparers (in alphabetical order)..... I-1  
 Table I-2. List of Reviewers and Advisors (in alphabetical order)..... I-3  
 Table I-3. Summary of Scoping Comments. .... I-5  
 Table K-2. Recovery Species for Kīlauea Point NWR..... K-9

