DRAFT ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE WESTERN SNOWY PLOVER

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EXECUTIVE SUMMARY

Introduction

1. The purpose of this report is to identify and analyze the potential economic impacts associated with the proposed critical habitat designation for the western snowy plover (plover) (*Charadrius alexandrinus nivosus*). This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service's (Service) Division of Economics.

2. The proposed plover designation includes 17,299 acres within 35 units. The Service proposed critical habitat for portions of plover breeding and wintering habitat in Washington, Oregon, and California. In addition, the Service identified 1,638 acres of habitat for possible inclusion in critical habitat. These areas are currently unoccupied or were unoccupied at the time of the listing, and the Service requests comment on whether these areas are essential to the conservation of the population. Essential habitat proposed for exclusion pursuant to section 4(b)(2) of the Endangered Species Act (the Act) includes 2,898 acres. These six areas are proposed for exclusion, because they are protected by existing conservation and management plans, management plans are being prepared for these areas, or the areas are military installations. Exhibits ES-1 through ES-3 provide maps of the potential critical habitat for the plover. These maps also show the density of urban population in proximity to potential habitat.

3. Of the total critical habitat acres proposed for designation, roughly 70 percent are located in California. Of the proposed acres, 26 percent are Federal lands, 51 percent are State lands, and the remaining 23 percent are private lands.

Exhibit ES-1

Western Snowy Plover Potential Critical Habitat:
Washington and Oregon Population Density

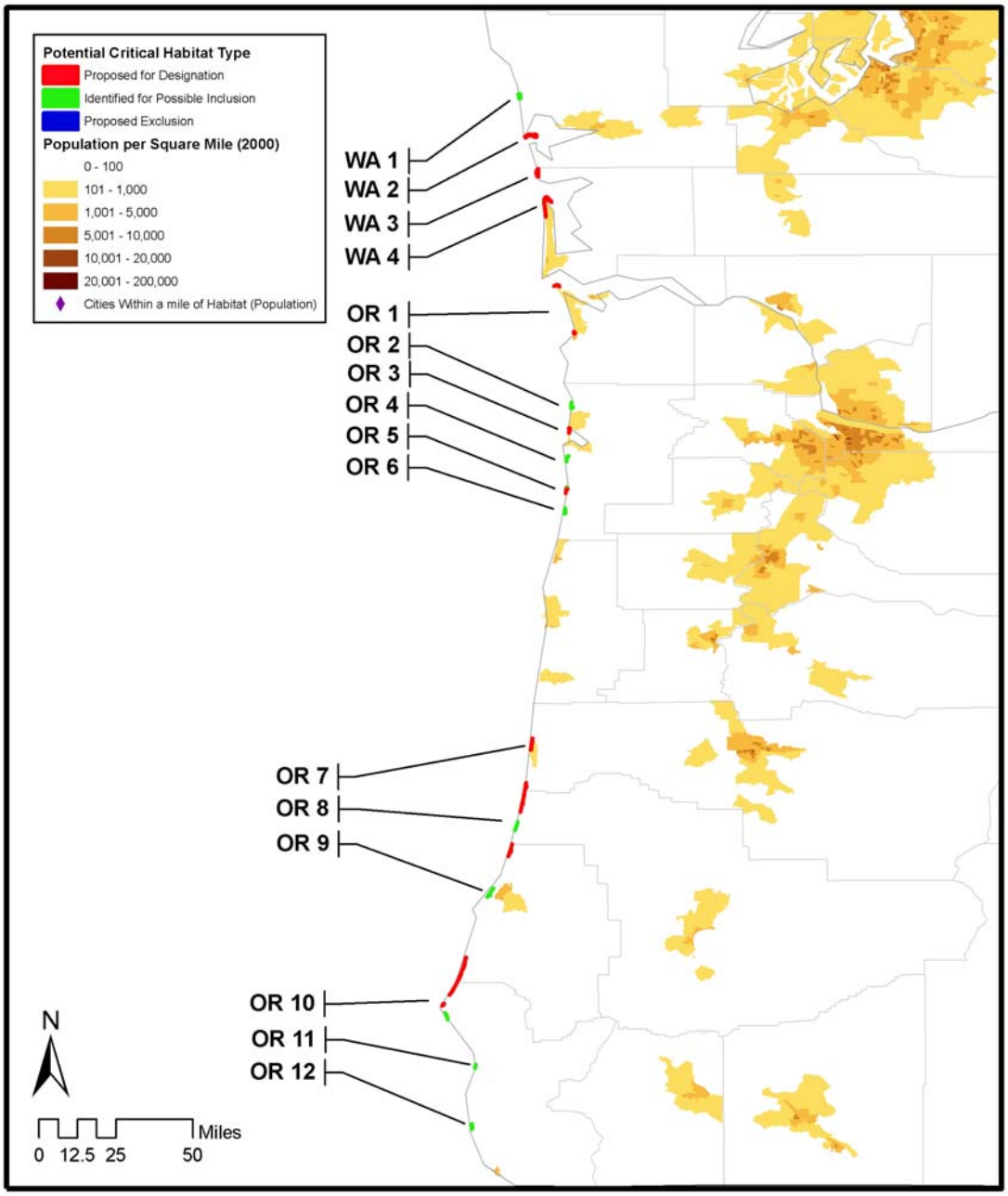


Exhibit ES-2

Western Snowy Plover Potential Critical Habitat:
Northern California Population Density

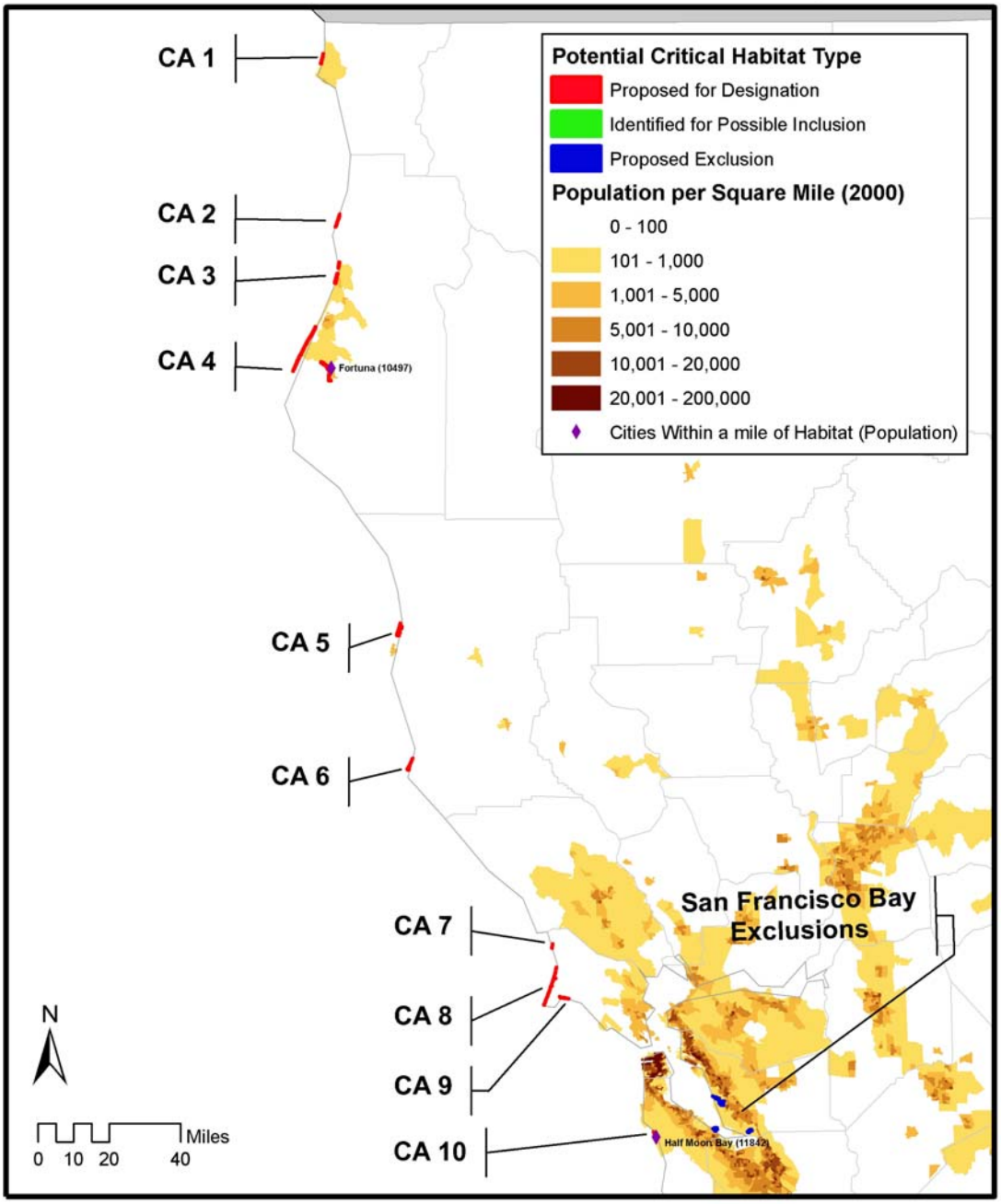
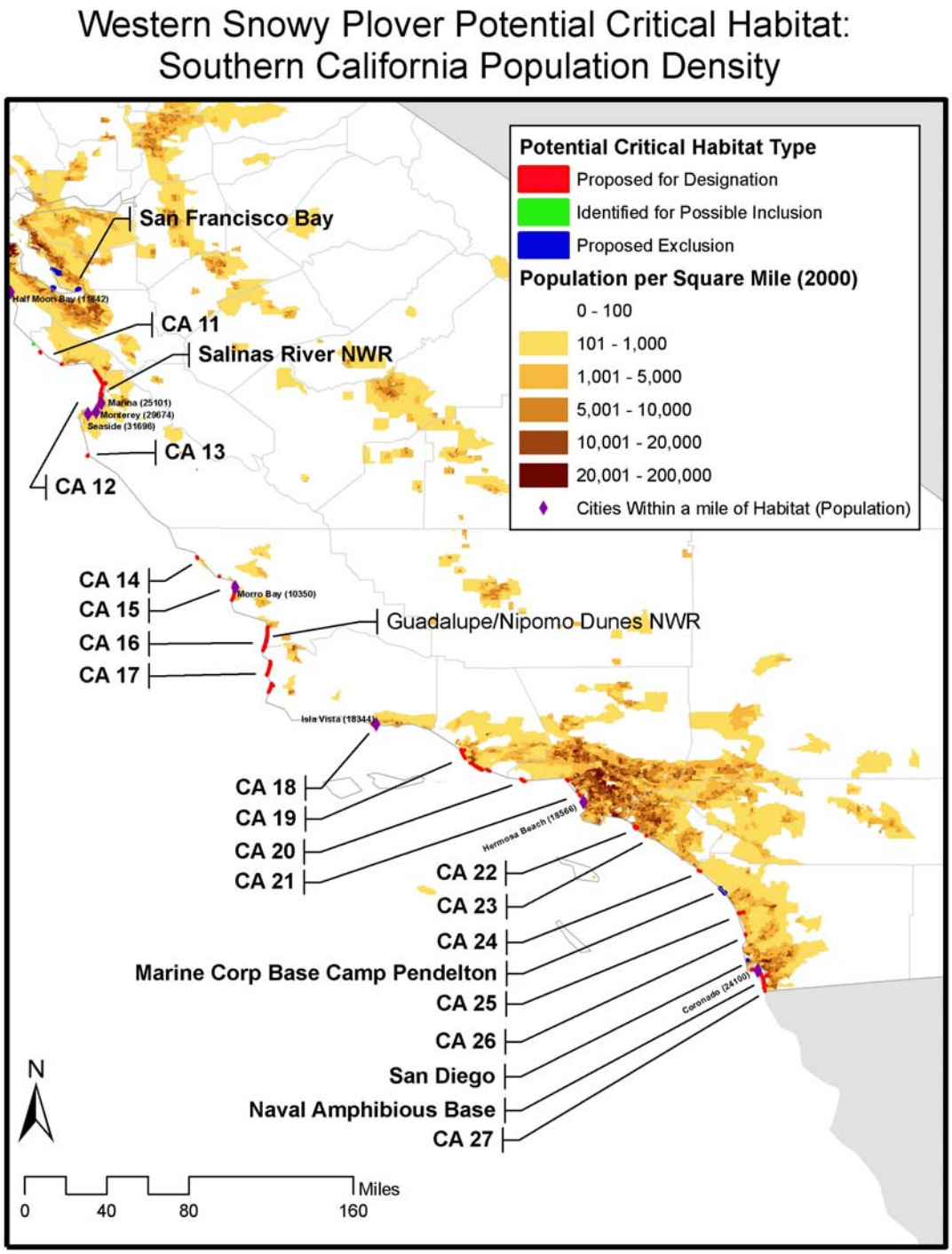


Exhibit ES-3


Western Snowy Plover Potential Critical Habitat:
Southern California Population Density
Potential Critical Habitat Type
Proposed for Designation
Identified for Possible Inclusion
Proposed Exclusion
Population per Square Mile (2000)
0 - 100
101 - 1,000
1,001 - 5,000
5,001 - 10,000
10,001 - 20,000
20,001 - 200,000
Cities Within a mile of Habitat (Population)
San Francisco Bay
Half Moon Bay (11842)
CA 11
Salinas River NWR
Marina (25101)
Monterey (29674)
Seaside (31696)
CA 13
CA 12
CA 14
CA 15
Morro Bay (10350)
Guadalupe/Nipomo Dunes NWR
CA 16
CA 17
Isla Vista (18344)
CA 18
CA 19
CA 20
CA 21
Hermosa Beach (18566)
CA 22
CA 23
CA 24
Marine Corp Base Camp Pendelton
CA 25
Coronado (24100)
CA 26
San Diego
Naval Amphibious Base
CA 27
N
Miles
0
40
80
160

4. Exhibit ES-4 summarizes key findings of the analysis. Analytic results are presented in greater detail later in this summary (see Exhibits ES-6 and ES-7).

Exhibit ES-4 **KEY FINDINGS**[1]
Total impacts: Future costs (from 2005 through 2025) at proposed critical habitat units are estimated to be $272.8 to $645.3 million on a present value basis and $514.9 to $1,222.7 million expressed in constant dollars. Each range is primarily the result of alternative methods for valuing beach recreation losses. **Activities most impacted:** The activities affected by plover protection efforts may include recreation, plover management, real estate development, military base operations, and gravel extraction. ♦ Recreational losses dominate the costs. In present value terms, future costs are estimated to range from $244.4 million to $611.1 million. The costs are driven by the lost pedestrian and equestrian opportunities. ♦ Future costs associated with managing the critical habitat units range from $18.3 million to $23.0 million in present value terms. ♦ Future costs to military institutions total roughly $9.1 million in present value terms. **Units with greatest impacts:** Over three quarters of all future costs are associated with five southern California units: Monterey to Moss Landing (CA-12C), Pismo Beach/Nipomo (CA-16), Morro Bay Beach (CA-15C), Jetty Road to Aptos (CA-12A), and Silver Strand (CA-27C). These areas generally include large tracts of proposed habitat and/or extensive management activities (e.g., fencing), as well as large public beach facilities.

Framework for the Analysis and Regulatory Alternatives Considered

5. Section 4(b)(2) of the Endangered Species Act (Act) requires the Service to designate critical habitat on the basis of the best scientific data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.[2] In addition, this analysis provides information to allow the Service to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).[3] This report also complies with direction from the U.S. 10th Circuit Court of Appeals that, when deciding which areas to designate as critical habitat, the economic analysis informing that decision should include "co-extensive" effects.[4]

[1] Unless otherwise noted, cost estimates included here are present values in today's dollars, using a discount rate of seven percent, because costs occur at different times across units and affected activities. Throughout the report, costs are provided in constant dollars (undiscounted) and present values using three and seven percent.

[2] 16 U.S.C. §1533(b)(2).

[3] Executive Order 12866, "Regulatory Planning and Review," September 30, 1993; 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.

[4] In 2001, the U.S. 10th Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes (*New Mexico Cattle Growers Ass'n v. U.S.F.W.S.*, 248 F.3d 1277 (10th Cir. 2001)).

6. Executive Order 12866 directs Federal Agencies to evaluate regulatory alternatives.[5] The Service identifies 81 subunits or areas of potential critical habitat, and proposes 61 subunits (grouped into 35 units) for designation as critical habitat. An alternative to the proposed rule is the designation of all 81 subunits and areas, and the potential impacts of all are estimated in this report. In addition, as discussed in the previous paragraph, section 4(b)(2) of the Act allows the Service to exclude additional areas proposed for designation based on economic impact and other relevant impact. Consideration of impacts at a sub-unit level may result in alternate combinations of essential habitat that may or may not ultimately be designated as critical habitat. As a result, the impacts of multiple combinations of essential habitat are also available to the Service.

7. To comply with the 10th Circuit's direction to include all co-extensive effects, this analysis considers the potential economic impacts of efforts to protect the plover and its habitat (hereinafter referred to collectively as "plover conservation efforts") in potential critical habitat. It does so by taking into account the cost of conservation-related measures that are likely to be associated with future economic activities that may adversely effect the habitat within the proposed boundaries. Actions undertaken to meet the requirements of other Federal, State, and local laws and policies may afford protection to the plover and its habitat, and thus contribute to the efficacy of critical habitat-related conservation and recovery efforts. Thus, the impacts of these activities are relevant for understanding the full impact of the proposed designation.

8. This analysis considers both economic efficiency and distributional effects. In the case of habitat conservation, efficiency effects generally reflect the opportunity costs associated with the commitment of resources to comply with habitat protection measures (e.g., lost economic opportunities associated with restrictions on land use). This analysis also addresses how potential economic impacts are likely to be distributed (distributional effects), including an assessment of any local or regional impacts of plover conservation efforts and the potential effects of conservation efforts on small entities and the energy industry. This information can be used by decision-makers to assess whether the effects of the designation might unduly burden a particular group or economic sector. Also, this analysis looks retrospectively at costs that have been incurred since the date the species was listed and considers those costs that may occur after the designation is finalized.

Results of the Analysis

9. Critical habitat for the plover was first designated in 1999, and that rule was partially vacated in 2003. As a result, some of the units proposed for critical habitat in this rulemaking are already legally designated critical habitat and have been operating under this designation for the past six years. In addition, some areas designated in 1999 are not reproposed for designation in this rulemaking. This analysis does not estimate cost savings associated with removing critical habitat designation in these areas not included for consideration in the current proposed rulemaking. The geographic scope of the analysis includes only potential critical habitat (i.e., units proposed for designation,

[5] Office of Management and Budget, Circular A-4, September 17, 2003, p. 7.

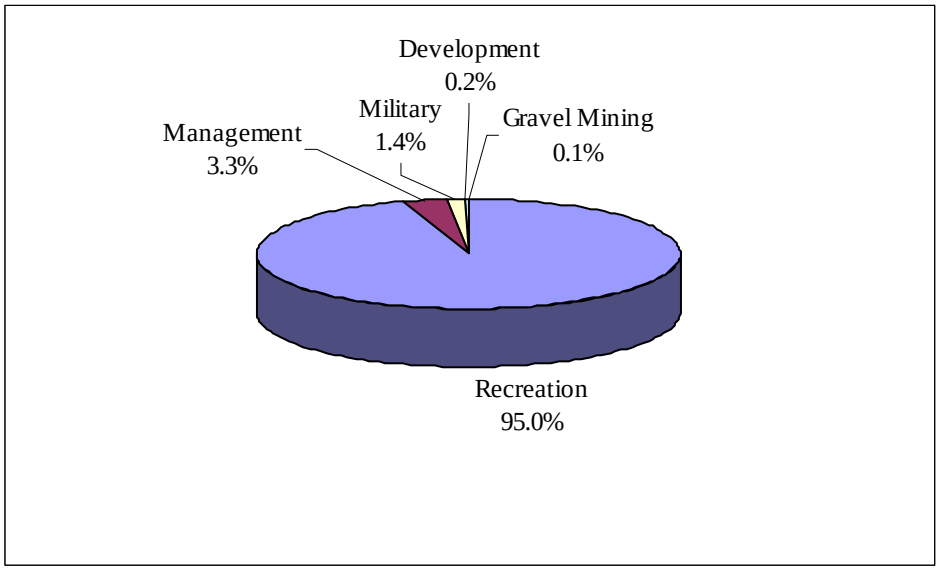
areas considered for possible inclusion, and areas proposed for exclusion) identified in this proposed rulemaking and adjacent areas with the potential to affect habitat.

Efficiency Impacts

10. Efficiency impacts can be broken down into costs associated with implementing plover and plover habitat management activities, the welfare losses to recreators resulting from those management activities, modifications to development and gravel mining projects, and the administrative costs associated with section 7 consultations. Exhibit ES-5 presents the distribution of efficiency impacts by activity, using the upper-bound future present value figures (based on a seven percent discount rate). As shown, welfare losses to recreators account for 95 percent of total future and ongoing costs in areas proposed for critical habitat, followed by general management efforts (including section 7 consultation) at three percent, management at military facilities at one percent, project modifications to development projects at less than one percent, and modification of gravel mining operations at less than one percent. Using the low-end estimates, the distribution is similar, but with a reduced share (90 percent) attributable to recreation, and somewhat larger shares attributable to management and development.

Exhibit ES-5

RELATIVE IMPACT BY AFFECTED ACTIVITY
(total present value impacts assuming a seven percent discount rate)



11. Exhibits ES-6 and ES-7 provide detailed cost information for all activities on a unit-by-unit basis. The first table summarizes past costs for the period from 1993 to 2004, while the second addresses future costs (2005 to 2025). The percent distribution of costs across activity also is provided. For detailed information about impacts by activity and unit, see Appendices C through G.

Exhibit ES-6
PAST IMPACTS TO ALL ACTIVITIES BY UNIT

POTENTIAL CRITICAL HABITAT UNITS	Unadjusted Impacts		Present Value 3%		Present Value 7%		Percent of Total Past Impacts by Activity (based on present value (7%) impacts)						
	Low	High	Low	High	Low	High	Manage-ment	Beach Raking	Vehicle Recreation	Pedestrian Recreation	Develop-ment	Military	Mining
Proposed for designation													
WA 2. Damon Pt, Oyhut	$14,000	$54,000	$15,000	$57,000	$16,000	$62,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WA 3. Midway Beach	$10,000	$39,000	$11,000	$42,000	$12,000	$45,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WA 4. Leadbetter Pt	$25,000	$97,000	$26,000	$103,000	$28,000	$111,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 3. Bayocean Spit	<$1,000	$1,000	<$1,000	$1,000	<$1,000	$1,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 7. Sutton/Baker Beaches	$230,000	$231,000	$272,000	$272,000	$340,000	$341,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 8A. Siltcoos River Spit	$230,000	$231,000	$272,000	$272,000	$340,000	$341,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	$130,000	$131,000	$154,000	$154,000	$192,000	$193,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 8D. Tenmile Creek Spit	$284,000	$363,000	$335,000	$429,000	$419,000	$537,000	63.5%	0.0%	5.3%	31.2%	0.0%	0.0%	0.0%
OR 9. Coos Bay N Spit	$430,000	$474,000	$545,000	$592,000	$754,000	$805,000	99.9%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
OR 10A. Bandon to Floras Lake	$345,000	$770,000	$369,000	$852,000	$403,000	$978,000	38.5%	0.0%	0.0%	61.5%	0.0%	0.0%	0.0%
CA 1. Lake Earl	$28,000	$45,000	$30,000	$48,000	$32,000	$52,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 2. Big Lagoon	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 3A. Clam Beach/Little Riv	$40,000	$44,000	$43,000	$47,000	$47,000	$52,000	61.5%	0.0%	6.3%	32.2%	0.0%	0.0%	0.0%
CA 3B. Mad River	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
CA 4A. Humboldt Bay, S Spit	$110,000	$130,000	$116,000	$137,000	$124,000	$146,000	99.8%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
CA 4B. Eel Riv N Spit & Beach	$23,000	$23,000	$24,000	$24,000	$26,000	$26,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 4C. Eel Riv S Spit & Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 4D. Eel River Gravel Bars	$86,000	$587,000	$95,000	$669,000	$111,000	$799,000	19.8%	0.0%	0.0%	0.0%	0.0%	0.0%	80.2%
CA 5. MacKerricher Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 6. Manchester Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 7. Dillon Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 8. Pt Reyes Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 9. Limantour Spit	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 10. Half Moon Bay	$11,000	$11,000	$12,000	$12,000	$13,000	$13,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 11B. Scott Cr. Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 11C. Wilder Cr. Beach	$11,000	$11,000	$12,000	$12,000	$13,000	$13,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 12A. Jetty Rd to Aptos	$4,928,000	$11,757,000	$5,238,000	$12,493,000	$5,671,000	$13,520,000	1.9%	0.0%	0.0%	98.1%	0.0%	0.0%	0.0%
CA 12B. Elkhorn Sl Mudflat	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 12C. Monterey to Moss Lnd	$4,337,000	$167,133,000	$4,430,000	$201,219,000	$4,575,000	$259,761,000	0.3%	0.0%	0.0%	98.0%	1.7%	0.0%	0.0%
CA 13. Pt Sur Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 14. San Simeon Beach	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 15A. Villa Cr Beach	$119,000	$119,000	$128,000	$128,000	$141,000	$141,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 15B. Atascadero Beach	$925,000	$4,849,000	$978,000	$5,116,000	$1,052,000	$5,488,000	2.2%	0.0%	0.0%	97.8%	0.0%	0.0%	0.0%

Exhibit ES-6
PAST IMPACTS TO ALL ACTIVITIES BY UNIT

POTENTIAL CRITICAL HABITAT UNITS	Unadjusted Impacts		Present Value 3%		Present Value 7%		Percent of Total Past Impacts by Activity (based on present value (7%) impacts)						
	Low	High	Low	High	Low	High	Manage-ment	Beach Raking	Vehicle Recreation	Pedestrian Recreation	Develop-ment	Military	Mining
CA 15C. Morro Bay Beach	$8,470,000	$16,142,000	$8,992,000	$17,132,000	$9,721,000	$18,515,000	1.9%	0.0%	0.0%	98.1%	0.0%	0.0%	0.0%
CA 16. Pismo Beach/Nipomo	$15,123,000	$22,170,000	$16,575,000	$23,923,000	$18,800,000	$26,559,000	24.4%	0.0%	44.3%	31.3%	0.0%	0.0%	0.0%
CA 17A. Vandenberg North	$2,995,000	$11,478,000	$3,362,000	$12,548,000	$3,942,000	$12,346,000	1.5%	0.0%	0.0%	69.5%	0.0%	29.0%	0.0%
CA 17B. Vandenberg South	$1,511,000	$9,933,000	$1,695,000	$10,817,000	$1,985,000	$10,319,000	0.0%	0.0%	0.0%	83.1%	0.0%	16.9%	0.0%
CA 18. Devereaux Beach	$385,000	$1,490,000	$420,000	$1,627,000	$472,000	$1,828,000	13.1%	0.0%	0.0%	86.9%	0.0%	0.0%	0.0%
CA 19A. Mandalay to Santa Clara	$19,000	$28,000	$21,000	$30,000	$23,000	$33,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 19B. Ormond Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 19C. Mugu Lagoon	$229,000	$283,000	$256,000	$315,000	$299,000	$365,000	7.2%	0.0%	0.0%	0.0%	0.0%	92.8%	0.0%
CA 19D. Mugu Lagoon S.	$46,000	$56,000	$52,000	$62,000	$61,000	$72,000	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
CA 20. Zuma Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 21A. Santa Monica Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 21B. Dockweiler N	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 21C. Dockweiler S	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 21D. Hermosa Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 22A. Bolsa Chica Reserve	$14,000	$23,000	$15,000	$24,000	$16,000	$26,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 22B. Huntington St. Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 23. Santa Ana River Mouth	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 24. San Onofre St Beach	$41,000	$59,000	$43,000	$62,000	$47,000	$67,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 25A Batiquitos West	$5,000	$7,000	$5,000	$8,000	$5,000	$9,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 25B. Batiquitos Middle	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 25C. Batiquitos East	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 26. Los Penasquitos	$5,000	$7,000	$5,000	$8,000	$5,000	$9,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 27A. North Island N.	$466,000	$475,000	$561,000	$570,000	$724,000	$734,000	3.6%	0.0%	0.0%	0.0%	0.0%	96.4%	0.0%
CA 27B. North Island S.	$268,000	$279,000	$323,000	$334,000	$418,000	$430,000	3.8%	0.0%	0.0%	0.0%	0.0%	96.2%	0.0%
CA 27C. Silver Strand	$2,798,000	$11,924,000	$3,021,000	$12,735,000	$3,352,000	$13,888,000	0.9%	0.0%	0.0%	95.9%	0.0%	3.3%	0.0%
CA 27D. Delta Beach	$333,000	$344,000	$402,000	$413,000	$520,000	$532,000	3.1%	0.0%	0.0%	0.0%	0.0%	96.9%	0.0%
CA 27E. Sweetwater NWR	$21,000	$51,000	$23,000	$55,000	$25,000	$59,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 27F. Tijuana River Beach	$331,000	$334,000	$381,000	$384,000	$459,000	$463,000	98.2%	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%
ALL OREGON (HCP)	$1,202,000	$1,202,000	$1,406,000	$1,406,000	$1,744,000	$1,744,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SUBTOTAL	**$46,583,000**	**$263,389,000**	**$50,664,000**	**$305,137,000**	**$56,932,000**	**$371,426,000**							
Areas identified for possible inclusion													
WA 1. Copalis Spit	$6,000	$25,000	$7,000	$27,000	$7,000	$29,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 1A. Columbia River Spit	<$1,000	$1,000	<$1,000	$1,000	<$1,000	$1,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 1B. Necanicum River Spit	<$1,000	$1,000	<$1,000	$1,000	<$1,000	$1,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 2. Nehalem River Spit	<$1,000	$1,000	<$1,000	$1,000	<$1,000	$1,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 4. Netarts Spit	<$1,000	$1,000	<$1,000	$1,000	<$1,000	$1,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 5A. Sand Lake North	<$1,000	$1,000	<$1,000	$1,000	<$1,000	$1,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Exhibit ES-6
PAST IMPACTS TO ALL ACTIVITIES BY UNIT

POTENTIAL CRITICAL HABITAT UNITS	Unadjusted Impacts		Present Value 3%		Present Value 7%		Percent of Total Past Impacts by Activity (based on present value (7%) impacts)						
	Low	High	Low	High	Low	High	Manage-ment	Beach Raking	Vehicle Recreation	Pedestrian Recreation	Develop-ment	Military	Mining
OR 5B. Sand Lake South	<$1,000	$1,000	<$1,000	$1,000	<$1,000	$1,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 6. Nestucca River Spit	<$1,000	$1,000	<$1,000	$1,000	<$1,000	$1,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 8C. N Umpqua River Spit	$130,000	$131,000	$154,000	$154,000	$192,000	$193,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 10B. Sixes River Spit	<$1,000	$1,000	<$1,000	$1,000	<$1,000	$1,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 10C. Elk River Spit	<$1,000	$1,000	<$1,000	$1,000	<$1,000	$1,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 11. Euchre Creek Spit	<$1,000	$1,000	<$1,000	$1,000	<$1,000	$1,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 12. Pistol River Spit	<$1,000	$1,000	<$1,000	$1,000	<$1,000	$1,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 11A. Waddell Cr Beach	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SUBTOTAL	**$141,000**	**$167,000**	**$166,000**	**$193,000**	**$205,000**	**$235,000**							
Areas proposed for exclusion													
Salinas River National Wildlife Refuge	$739,000	$748,000	$858,000	$868,000	$1,054,000	$1,065,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Guadalupe/Nipomo Dunes National Wildlife Refuge	$261,000	$271,000	$283,000	$293,000	$315,000	$326,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
San Diego	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
Marine Corps Base Camp Pendleton	$944,000	$944,000	$1,111,000	$1,111,000	$1,396,000	$1,396,000	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
Naval Amphibious Base	$558,000	$558,000	$674,000	$674,000	$873,000	$873,000	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
San Francisco Bay	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
SUBTOTAL	**$2,502,000**	**$2,521,000**	**$2,927,000**	**$2,947,000**	**$3,638,000**	**$3,659,000**							

Exhibit ES-7
FUTURE IMPACTS TO ALL ACTIVITIES BY UNIT

POTENTIAL CRITICAL HABITAT UNITS	Constant Dollar Impacts		Present Value 3%		Present Value 7%		Percent of Total Future Impacts by Activity (based on present value (7%) impacts)						
	Low	High	Low	High	Low	High	Manage-ment	Beach Raking	Vehicle Recreation	Pedestrian Recreation	Develop-ment	Military	Mining
Proposed for designation													
WA 2. Damon Pt, Oyhut	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
WA 3. Midway Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
WA 4. Leadbetter Pt	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
OR 3. Bayocean Spit	$431,000	$2,572,000	$296,000	$1,764,000	$187,000	$1,111,000	16.9%	0.0%	0.0%	83.1%	0.0%	0.0%	0.0%
OR 7. Sutton/Baker Beaches	$413,000	$413,000	$312,000	$312,000	$228,000	$228,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 8A. Siltcoos River Spit	$413,000	$413,000	$312,000	$312,000	$228,000	$228,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	$203,000	$203,000	$154,000	$154,000	$112,000	$112,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 8D. Tenmile Creek Spit	$532,000	$707,000	$402,000	$534,000	$293,000	$389,000	58.7%	0.0%	6.0%	35.4%	0.0%	0.0%	0.0%
OR 9. Coos Bay N Spit	$527,000	$527,000	$398,000	$398,000	$291,000	$291,000	99.7%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%
OR 10A. Bandon to Floras Lake	$756,000	$1,889,000	$571,000	$1,425,000	$417,000	$1,037,000	35.8%	0.0%	0.3%	63.9%	0.0%	0.0%	0.0%
CA 1. Lake Earl	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 2. Big Lagoon	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 3A. Clam Beach/Little Riv	$879,000	$1,527,000	$663,000	$1,143,000	$483,000	$824,000	10.6%	0.0%	2.5%	44.7%	42.2%	0.0%	0.0%
CA 3B. Mad River	$36,000	$36,000	$27,000	$27,000	$19,000	$19,000	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
CA 4A. Humboldt Bay, S Spit	$895,000	$900,000	$676,000	$681,000	$494,000	$497,000	99.2%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%
CA 4B. Eel Riv N Spit & Beach	$158,000	$158,000	$119,000	$119,000	$87,000	$87,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 4C. Eel Riv S Spit & Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 4D. Eel River Gravel Bars	$158,000	$1,334,000	$119,000	$1,009,000	$87,000	$736,000	21.3%	0.0%	0.0%	0.0%	0.0%	0.0%	78.7%
CA 5. MacKerricher Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 6. Manchester Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 7. Dillon Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 8. Pt Reyes Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 9. Limantour Spit	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 10. Half Moon Bay	$63,000	$63,000	$48,000	$48,000	$35,000	$35,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 11B. Scott Cr. Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 11C. Wilder Cr. Beach	$63,000	$63,000	$48,000	$48,000	$35,000	$35,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 12A. Jetty Rd to Aptos	$38,394,000	$92,231,000	$28,434,000	$68,277,000	$20,235,000	$48,563,000	1.5%	0.0%	0.0%	98.5%	0.0%	0.0%	0.0%
CA 12B. Elkhorn Sl Mudflat	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 12C. Monterey to Moss Lnd	$153,350,000	$399,640,000	$113,532,000	$295,819,000	$80,760,000	$210,378,000	0.4%	0.0%	0.0%	99.0%	0.6%	0.0%	0.0%
CA 13. Pt Sur Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 14. San Simeon Beach	$16,000	$16,000	$12,000	$12,000	$9,000	$9,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Exhibit ES-7
FUTURE IMPACTS TO ALL ACTIVITIES BY UNIT

POTENTIAL CRITICAL HABITAT UNITS	Constant Dollar Impacts		Present Value 3%		Present Value 7%		Percent of Total Future Impacts by Activity (based on present value (7%) impacts)						
	Low	High	Low	High	Low	High	Manage-ment	Beach Raking	Vehicle Recreation	Pedestrian Recreation	Develop-ment	Military	Mining
CA 15A. Villa Cr Beach	$693,000	$693,000	$524,000	$524,000	$383,000	$383,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 15B. Atascadero Beach	$10,843,000	$59,637,000	$8,034,000	$44,144,000	$5,721,000	$31,395,000	1.0%	0.0%	0.0%	99.0%	0.0%	0.0%	0.0%
CA 15C. Morro Bay Beach	$72,936,000	$139,764,000	$54,005,000	$103,461,000	$38,421,000	$73,584,000	1.3%	0.0%	0.0%	98.7%	0.0%	0.0%	0.0%
CA 16. Pismo Beach/Nipomo	$101,858,000	$206,048,000	$75,897,000	$153,006,000	$54,484,000	$109,309,000	8.9%	0.0%	38.5%	52.6%	0.0%	0.0%	0.0%
CA 17A. Vandenberg North	$10,368,000	$62,040,000	$7,819,000	$46,060,000	$5,692,000	$32,880,000	0.0%	0.0%	0.0%	84.7%	0.0%	15.3%	0.0%
CA 17B. Vandenberg South	$5,675,000	$57,348,000	$4,271,000	$42,512,000	$3,101,000	$30,290,000	0.0%	0.0%	0.0%	91.9%	0.0%	8.1%	0.0%
CA 18. Devereaux Beach	$1,619,000	$15,343,000	$1,208,000	$11,490,000	$869,000	$8,294,000	55.1%	0.0%	0.0%	44.9%	0.0%	0.0%	0.0%
CA 19A. Mandalay to Santa Clara	$32,000	$32,000	$24,000	$24,000	$17,000	$17,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 19B. Ormond Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 19C. Mugu Lagoon	$327,000	$340,000	$258,000	$270,000	$200,000	$212,000	10.5%	0.0%	0.0%	0.0%	0.0%	89.5%	0.0%
CA 19D. Mugu Lagoon S.	$67,000	$68,000	$52,000	$53,000	$40,000	$41,000	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
CA 20. Zuma Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 21A. Santa Monica Beach	$6,491,000	$6,491,000	$4,804,000	$4,804,000	$3,415,000	$3,415,000	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 21B. Dockweiler N	$20,363,000	$20,363,000	$15,070,000	$15,070,000	$10,714,000	$10,714,000	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 21C. Dockweiler S	$20,363,000	$20,363,000	$15,070,000	$15,070,000	$10,714,000	$10,714,000	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 21D. Hermosa Beach	$41,793,000	$41,793,000	$30,929,000	$30,929,000	$21,990,000	$21,990,000	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 22A. Bolsa Chica Reserve	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 22B. Huntington St. Beach	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 23. Santa Ana River Mouth	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 24. San Onofre St Beach	$14,000	$22,000	$14,000	$22,000	$14,000	$22,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CA 25A Batiquitos West	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 25B. Batiquitos Middle	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 25C. Batiquitos East	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 26. Los Penasquitos	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 27A. North Island N.	$864,000	$864,000	$654,000	$654,000	$477,000	$477,000	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
CA 27B. North Island S.	$505,000	$505,000	$382,000	$382,000	$279,000	$279,000	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
CA 27C. Silver Strand	$18,198,000	$83,034,000	$13,482,000	$61,465,000	$9,599,000	$43,714,000	0.5%	0.0%	0.0%	98.8%	0.0%	0.7%	0.0%
CA 27D. Delta Beach	$630,000	$630,000	$476,000	$476,000	$348,000	$348,000	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
CA 27E. Sweetwater NWR	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
CA 27F. Tijuana River Beach	$940,000	$940,000	$710,000	$710,000	$519,000	$519,000	98.9%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%
ALL OREGON (HCP)	$3,043,000	$3,643,000	$2,377,000	$2,823,000	$1,820,000	$2,138,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SUBTOTAL	**$514,906,000**	**$1,222,650,000**	**$382,183,000**	**$906,029,000**	**$272,817,000**	**$645,314,000**							
Areas identified for possible inclusion													
WA 1. Copalis Spit	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
OR 1A. Columbia River Spit	$592,000	$1,493,000	$443,000	$1,111,000	$319,000	$793,000	39.7%	0.0%	0.0%	60.3%	0.0%	0.0%	0.0%
OR 1B. Necanicum River Spit	$574,000	$574,000	$427,000	$427,000	$305,000	$305,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OR 2. Nehalem River Spit	$1,152,000	$2,885,000	$856,000	$2,141,000	$609,000	$1,521,000	20.1%	0.0%	0.0%	79.9%	0.0%	0.0%	0.0%

Exhibit ES-7
FUTURE IMPACTS TO ALL ACTIVITIES BY UNIT

POTENTIAL CRITICAL HABITAT UNITS	Constant Dollar Impacts		Present Value 3%		Present Value 7%		Percent of Total Future Impacts by Activity (based on present value (7%) impacts)						
	Low	High	Low	High	Low	High	Manage-ment	Beach Raking	Vehicle Recreation	Pedestrian Recreation	Develop-ment	Military	Mining
OR 4. Netarts Spit	$146,000	$449,000	$86,000	$264,000	$44,000	$133,000	32.6%	0.0%	0.0%	67.4%	0.0%	0.0%	0.0%
OR 5A. Sand Lake North	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
OR 5B. Sand Lake South	$807,000	$1,206,000	$554,000	$828,000	$350,000	$522,000	35.9%	0.0%	0.0%	64.1%	0.0%	0.0%	0.0%
OR 6. Nestucca River Spit	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
OR 8C. N Umpqua River Spit	$577,000	$581,000	$391,000	$394,000	$246,000	$248,000	87.1%	0.0%	7.2%	5.7%	0.0%	0.0%	0.0%
OR 10B. Sixes River Spit	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
OR 10C. Elk River Spit	$294,000	$365,000	$187,000	$232,000	$105,000	$131,000	79.2%	0.0%	0.6%	20.2%	0.0%	0.0%	0.0%
OR 11. Euchre Creek Spit	$289,000	$305,000	$183,000	$194,000	$103,000	$109,000	94.5%	0.0%	0.0%	5.5%	0.0%	0.0%	0.0%
OR 12. Pistol River Spit	$146,000	$174,000	$86,000	$102,000	$44,000	$52,000	84.2%	0.0%	0.0%	15.8%	0.0%	0.0%	0.0%
CA 11A. Waddell Cr Beach	$16,000	$16,000	$12,000	$12,000	$9,000	$9,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SUBTOTAL	**$4,591,000**	**$8,048,000**	**$3,226,000**	**$5,706,000**	**$2,133,000**	**$3,822,000**							
Areas proposed for exclusion													
Salinas River National Wildlife Refuge	$3,587,000	$3,587,000	$2,712,000	$2,712,000	$1,980,000	$1,980,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Guadalupe/Nipomo Dunes National Wildlife Refuge	$1,103,000	$1,103,000	$834,000	$834,000	$609,000	$609,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
San Diego	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
Marine Corps Base Camp Pendleton	$2,488,000	$2,488,000	$2,013,000	$2,013,000	$1,374,000	$1,374,000	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
Naval Amphibious Base	$1,067,000	$1,067,000	$806,000	$806,000	$589,000	$589,000	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
San Francisco Bay	$0	$0	$0	$0	$0	$0	-	-	-	-	-	-	-
SUBTOTAL	**$8,244,000**	**$8,244,000**	**$6,365,000**	**$6,365,000**	**$4,552,000**	**$4,552,000**							

12. Annualized costs are presented below in Exhibit ES-8. The annual future costs for areas proposed for critical habitat is approximately $25.1 million to $59.5 million, applying a seven percent discount rate. See Appendix B for annualized costs by unit.

Exhibit ES-8

ANNUALIZED COSTS OF POTENTIAL CRITICAL HABITAT

Category	Annualized 3%		Annualized 7%	
	Low	High	Low	High
Units proposed for designation	$24,743,000	$58,726,000	$25,127,000	$59,504,000
Areas identified for possible inclusion	$209,000	$370,000	$197,000	$353,000
Areas proposed for exclusion	$413,000	$413,000	$420,000	$420,000

Welfare Losses Associated with Beach Recreation

13. The analysis identifies past and future costs resulting from restrictions on beach use. Types of users affected by use restrictions include pedestrian visitors, horseback riders, and motor vehicle visitors (e.g., off-road vehicle use (OHV), all-terrain vehicle use (ATV), street licensed vehicle use). Ideally, the analysis would use a publicly-available economic model of recreators' preferences for different beach locations and activities to predict how beach visitation might change as a result of plover protections and to estimate associated welfare losses. For example, as a result of fencing at one beach, a recreator may decide to visit the second-best location on that beach, visit his usual location but experience a diminished trip value due to crowding, visit a less-preferred beach, or decide not to take a beach trip at all. The consumer surplus loss for each option varies depending on the beach-goers' value of the first choice beach experience relative to that of each of the alternatives.

14. The National Marine Fisheries Service (NOAA) is currently developing such a model for recreational beach use in Southern California, however at this time it is not available for public use.[6] In the absence of such a model, two methods are applied to assess potential losses. The first method (Method 1) assumes that recreators will take fewer trips to the beach as a result of plover management efforts. This approach makes the simplifying assumption that foregone trips are proportional to the total beach length that is fenced. As a result, this assumption overstates the actual welfare losses resulting from plover management efforts. The second method (Method 2) estimates losses assuming that recreators take the same number of beach trips, but have a lower-quality recreational experience as a result of constraints such as fencing or area closures.

[6] For more information on NOAA's model, see: http://marineeconomics.noaa.gov/SCBeach/welcome.html.

15. Both approaches rely on a benefits transfer methodology in which literature-based per-trip consumer surplus values are applied to beach visits. US Environmental Protection Agency (EPA) outlines steps for conducting credible benefit transfers and discusses the types of economic methods used to estimate consumer surplus values in its *Guidelines for Preparing Economic Analyses*.[7] This document has been extensively peer-reviewed by the Environmental Economics Advisory Committee of the USEPA's Science Advisory Board, which gave the document a rating of "excellent."[8] This analysis applies a benefits transfer methodology that is consistent with EPA's guidelines. The studies from which the consumer surplus values are obtained primarily employ travel cost and random utility travel cost models; diminished value associated with increased marine debris is obtained from a study that employs a contingent valuation method. The use of surplus values derived from these types of valuation models are also consistent with EPA's guidelines.

16. Under Method 1, total future welfare losses associated with plover conservation efforts in proposed critical habitat are anticipated to be $609.4 million in present value terms assuming a seven percent discount rate ($1.16 billion in constant dollars). Under Method 2, the losses are estimated to be $246.0 million ($467.9 million in constant dollars). Over 85 percent of these impacts are associated with pedestrian and equestrian access restrictions. Over 77 percent of recreational losses are estimated to occur at five locations: Monterey to Moss Landing (CA-12C), Pismo Beach/Nipomo (CA-16), Morro Bay Beach (CA-15C), Jetty Road to Aptos (CA-12A), and Silver Strand (CA-27C).

Costs of Developing and Administering Plover Management Plans

17. This analysis estimates the past and future ongoing economic impacts associated with plover management activities, including the development and administration of habitat conservation plans (HCPs), resource management plans, and conservation plans. The costs associated with section 7 consultation for the plover are also included in these costs. All of the future costs are ongoing, as they result from the implementation of existing management plans.

18. In the future, the present value (assuming a seven percent discount rate) of plover management costs is estimated to range from $6.5 million to $20.9 million in areas proposed for critical habitat. Nearly half these costs result from implementation of the HCP developed by California State Parks for Oceano Dunes (CA-16). Likely future plover protections at these sites include exclosures; symbolic fencing; signage; speed limits; increased enforcement; education; ensuring compliance of other concessions, support agencies, and organizations; maintenance project protective measures; protection of chicks and eggs outside of fenced areas; predator management; and non-breeding season protection.

[7] US Environmental Protection Agency, *Guidelines for Preparing Economic Analyses*, EPA 240-R-00-003, September 2000.

[8] Ibid. p. i, 3rd paragraph.

Development and Related Impacts

19. The units and areas considered for critical habitat designation by the Service in the proposed rule comprise primarily open sand beach areas down to the low mean water line. The sandy substrate of the potential critical habitat is not typically conducive to construction of buildings or infrastructure. It is therefore unlikely that development exists within or will be proposed or permitted directly within these areas. However, increased development in the region surrounding plover habitat may lead to increased recreational use of the beaches containing habitat, or increased ambient light and noise. The increased human/beach interaction may make the area less attractive to the plovers for nesting or breeding.

20. Planners and developers in the counties containing potential critical habitat were contacted and asked to provide information about development potential along the coastline and adjacent to potential critical habitat. Based on information provided, plover conservation efforts will likely impact two projects. Humboldt County anticipates revenue losses from capacity restriction at its campground at Clam Beach County Park (Unit CA-3A). Over the next 20 years, the present value of the losses may total $348,000 (seven percent discount rate); in constant terms, the losses may total $630,000. The Monterey Bay Shores Development Project in Sand City (Unit CA 12-C) has experienced past costs of approximately $4 million associated with HCP development and open space purchases. Future monitoring efforts may yield costs of between $580,000 and $1.16 million (discounted) or $1.05 million to $2.1 million (constant dollars).

21. In addition to direct modification to development projects, potential indirect impacts may also occur. Property value research demonstrates that residential developments closer to the shoreline are more valuable than developments further from the coast.[9] Components of ocean access that may affect property value include aesthetics (i.e., view) and recreational access. Research was not identified, however, that correlated level of beach access to property value. Hence, no data are available to estimate potential percentage decrease in property values if access to nearby beaches is restricted.

Impacts at Military Facilities

22. Impacts to military installations relate primarily to monitoring, predator management, and habitat enhancement projects. With the exception of habitat enhancement projects, these costs reflect the ongoing expenses incurred by these facilities for the management programs outlined in the Integrated Natural Resource Management Plans (INRMPs). The present value future costs in proposed critical habitat total $9.1 million, assuming a seven percent discount rate; constant dollar costs are $16.5 million. Approximately 80 percent of these costs are associated with Vandenberg Air Force Base (Units CA-17A and CA-17B). *Note that this analysis does not attempt to quantify the impact to military readiness that may result from plover conservation efforts.*

[9] Brookshire et al., "Valuing Public Goods: A Comparison of Survey and Hedonic Approaches," *The American Economic Review*, March 1982, pp. 165-177; Mendelsohn, et al., "Measuring Hazardous Waste Damages with Panel Models," *Journal of Environmental Economics and Management* 22:259-271, 1992.

Impacts to Gravel Mining Activities

23. Gravel mining occurs in one proposed critical habitat unit, CA-4D Eel River Gravel Bar. Six gravel extractors operate on the Eel River, including Eureka Sand and Gravel, Drake Materials, Mercer-Fraser, Hansen Truckstop Inc., Rock and Gadberry Gravel, and Humboldt County Department of Public Works. Impacts to these entities relate primarily to annual monitoring and reporting requirements and timing restrictions stipulated in the Letter of Permission (LOP) that authorizes the U.S. Army Corps of Engineers (USACE) to issue gravel extraction permits to mining companies. The estimated present value of future costs associated with mining activities ranges from $58,000 to $580,000, assuming a seven percent discount rate ($105,000 to $1.1 million in constant dollars).

Distributional Impacts

24. This analysis also analyzes how potential economic impacts are likely to be distributed across the affected communities in order to assess whether a particular group or economic sector bears an undue proportion of the impacts. This section includes an assessment of any local or regional impacts of plover conservation and the potential effects of conservation efforts on small entities and the energy industry.

25. To estimate the regional economic impact of lost beach recreation trips, the analysis relies on information on the total number of trips potentially lost due to plover conservation efforts and an estimate of the expenditures made per beach recreation-related trip. Potentially affected industries are those that provide fuel, food and drink, lodging, recreation equipment, private beach facilities, sporting goods, and incidentals and sundries to recreators.

26. The estimated regional economic impact of a loss of approximately 1.5 million trips in 2005 is $127.1 million in California, Oregon, and Washington. The lost trips are also estimated to impact as may as 1,922 jobs in California, Oregon, and Washington. The estimates of these regional economic impacts represent snapshots of the changes in revenues, jobs, and local taxes that may result from plover conservation efforts. These impacts would occur once (in 2005), and would persist for some period of time until the economy adjusts to the change. Thus, these are not annual impact estimates (as are the surplus measures), but one time changes in the economic activity levels. The estimates calculated in this analysis reflect impacts in year 2005.

27. A loss in spending of $127 million represents approximately two percent of beach spending in California alone, as estimated by Dr. Philip King of San Francisco State University.[10] Estimates of total beach spending in Oregon and Washington are not available at this time.

[10] King, Philip, *The Potential Loss in Gross National Product and Gross State Product from a Failure to Maintain California's Beaches*, prepared for the California Department of Boating and Waterways, Fall 2003, pp. 15-16.

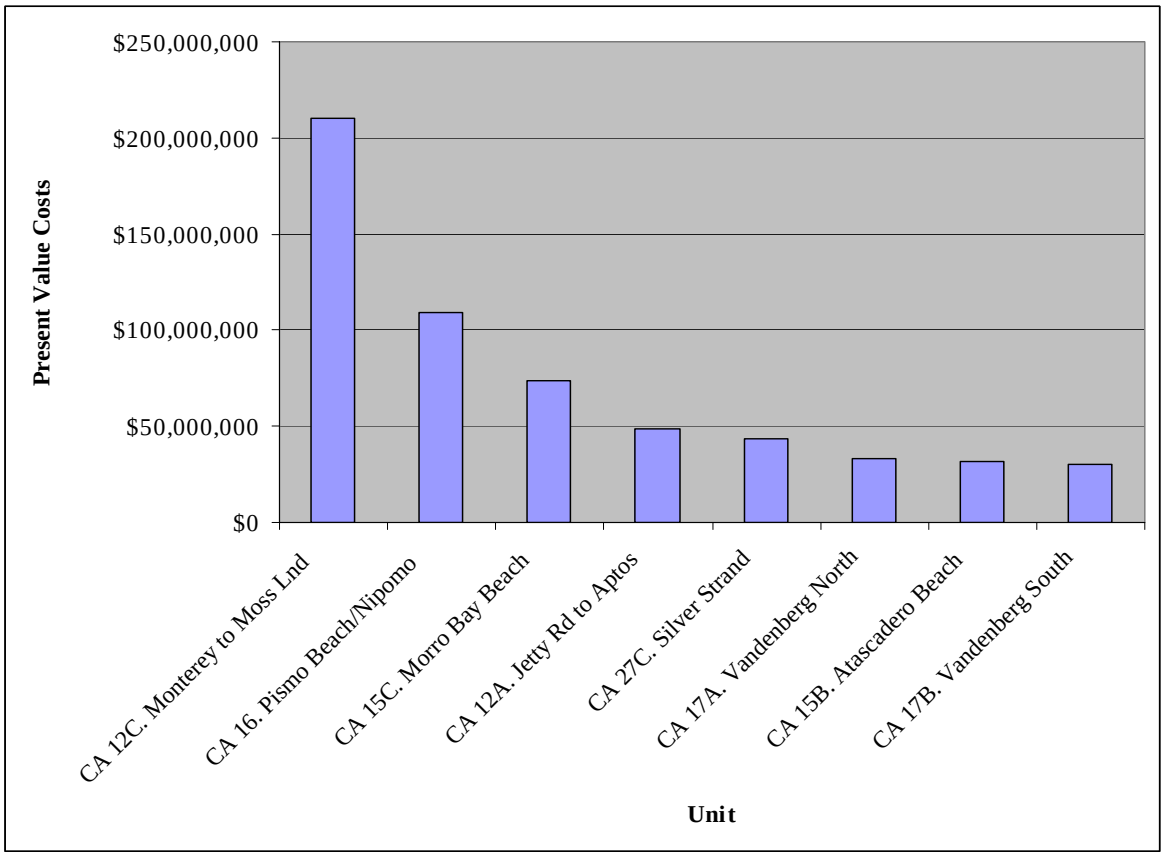
28. Appendix A describes potential impacts to small entities and to the energy industry.

Areas Most Likely to Experience Impacts

29. Exhibit ES-9 illustrates which proposed critical habitat units account for the greatest share of costs. The chart displays the present value (seven percent discount rate), high-end future costs for the top eight units. These units account for over 90 percent of total future costs and all are located in southern California.

Exhibit ES-9

RANKING OF TOP UNITS BASED ON FUTURE PRESENT VALUE COSTS



30. Exhibit ES-10 illustrates that the ranking of sites changes slightly if low, rather than high, estimates are applied. Specifically, the ranking based on low-end costs includes a number of California units where effects from reduced beach raking are likely to drive costs. For a complete comparison of unit rankings for all the units proposed for designation, see Appendix H.

Exhibit ES-10 COMPARISON OF TOP SITES USING HIGH AND LOW PRESENT VALUE ESTIMATES			
Ranking Based on High Present Value Estimate		**Ranking Based on Low Present Value Estimate**	
Unit	**Present Value Costs**	**Unit**	**Present Value Costs**
CA 12C. Monterey to Moss Lnd	$210,378,000	CA 12C. Monterey to Moss Lnd	$80,760,000
CA 16. Pismo Beach/Nipomo	$109,309,000	CA 16. Pismo Beach/Nipomo	$54,484,000
CA 15C. Morro Bay Beach	$73,584,000	CA 15C. Morro Bay Beach	$38,421,000
CA 12A. Jetty Rd to Aptos	$48,563,000	CA 21D. Hermosa Beach	$21,990,000
CA 27C. Silver Strand	$43,714,000	CA 12A. Jetty Rd to Aptos	$20,235,000
CA 17A. Vandenberg North	$32,880,000	CA 21B. Dockweiler N	$10,714,000
CA 15B. Atascadero Beach	$31,395,000	CA 21C. Dockweiler S	$10,714,000
CA 17B. Vandenberg South	$30,290,000	CA 27C. Silver Strand	$9,599,000

31. As noted, recreational losses account for the vast majority of costs associated with plover conservation. Therefore, the driving factors at the units with high costs relate primarily to physical beach conditions and visitation patterns. In particular, all of the top sites have some combination of the following characteristics: large critical habitat areas; large shares of beach affected by plover management (e.g., fencing); and public parks that attract large numbers of visitors.

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FRAMEWORK FOR ANALYSIS SECTION 1

32. The purpose of this report is to estimate the economic impact of actions taken to protect the federally-listed western snowy plover (the plover) (*Charadrius alexandrinus nivosus*) and its habitat. It attempts to quantify the economic effects associated with the proposed designation of critical habitat. It does so by taking into account the cost of conservation-related measures that are likely to be associated with future economic activities that may adversely affect the habitat within the proposed boundaries. The analysis looks retrospectively at costs incurred since the plover was listed, and it attempts to predict future costs likely to occur after the 2005 proposed CHD is finalized.

33. This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.[11] In addition, this information allows the U.S. Fish and Wildlife Service (the Service) to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).[12] This report also complies with direction from the U.S. Court of Appeals for the 10th Circuit that "co-extensive" effects should be included in the economic analysis to inform decision-makers regarding which areas to designate as critical habitat.[13]

34. This section describes the framework for this analysis. First, it describes the general analytic approach to estimating economic effects, including a discussion of both efficiency and distributional effects. Next, this section discusses the scope of the analysis, including the link between existing and critical habitat-related protection efforts and economic impacts. Next, it presents the analytic time frame used in the report. Finally, this section lists the information sources relied upon in this analysis.

[11] 16 U.S.C. §1533(b)(2).

[12] Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993; 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.

[13] In 2001, the U.S. Court of Appeals for the 10th Circuit instructed the Service to conduct a full analysis of all of the economic impacts of proposed CHD, regardless of whether those impacts are attributable co-extensively to other causes (*New Mexico Cattle Growers Ass'n v. U.S.F.W.S.*, 248 F.3d 1277 (10th Cir. 2001)).

1.1 Approach to Estimating Economic Effects

35. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the plover and its habitat (hereinafter referred to collectively as "plover 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 activities that can take place on a parcel of land are 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 plover conservation efforts.

36. 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 the effects of plover conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a relatively small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts. The difference between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

1.1.1 Efficiency Effects

37. At the guidance of the Office of Management and Budget (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 context of regulations that protect plover 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.[14]

38. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal landowner or 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

[14] 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.

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.

39. 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, a designation that precludes 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.

40. This analysis begins by measuring costs associated with measures taken to protect plover and its 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.

Calculating Present Value and Annualized Impacts

For each land use activity, this analysis compares economic impacts incurred in different time periods in present value terms. The present value presents 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 costs to present value terms requires the following: a) past or projected future costs of plover conservation efforts; and b) the specific years in which these impacts have or are expected to be incurred. With these data, the present value of the past or future stream of impacts (PV_c) of plover conservation efforts from year t to T is measured in 2005 dollars according to the following standard formula:[a]

$$PV_c = \sum_{t}^{T} \frac{C_t}{(1+r)^{t-2005}}$$

C_t = forecast cost of plover conservation efforts in year t

r = discount rate[b]

Impacts of conservation efforts 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, however, all activities employ a forecast period of 21 years, 2005 through 2025. Annualized impacts of future plover conservation efforts (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, 21 years)

[a] To derive the present value of past conservation efforts for this analysis, t is 1993 and T is 2004; to derive the present value of future conservation efforts, t is 2005 and T is 2025.

[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.)

1.1.2 Distributional and Regional Economic Effects

41. 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.[15] This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, 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 and Energy Supply, Distribution, and Use

42. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the Regulatory Flexibility Act, might be affected by future plover conservation efforts.[16] In addition, 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.[17]

Regional Economic Effects

43. 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 recreationists) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreationists). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.

44. 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

[15] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[16] 5 U.S.C. § 601 *et seq.*

[17] Executive Order 13211, *Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use*, May 18, 2001.

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.

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

1.2 Scope of the Analysis

46. This analysis identifies those economic activities believed to most likely threaten the listed species and its habitat and, where possible, quantifies the economic impact to avoid, mitigate, or compensate for such threats within the boundaries of the CHD. In instances where critical habitat is being proposed after a species is listed, some future impacts may be unavoidable, regardless of the final designation and exclusions under 4(b)(2). However, due to the difficulty in making a credible distinction between listing and critical habitat effects within critical habitat boundaries, this analysis considers all future conservation-related impacts to be coextensive with the designation.[18,19]

47. Coextensive effects may also include impacts associated with overlapping protective measures of other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation. In past instances, some of these measures have been precipitated by the listing of the species and impending designation of critical habitat. Because habitat conservation efforts affording protection to a listed species likely contribute to the efficacy of the CHD efforts, the impacts of these actions are considered relevant for understanding the full effect of the proposed CHD. Enforcement actions taken in response to violations of the Act, however, are not included.

1.2.1 Sections of the Act Relevant to the Analysis

48. This analysis focuses on activities that are influenced by the Service through sections 4, 7, 9, and 10 of the Act. Section 4 of the Act focuses on the listing and

[18] In 2001, the U.S. Court of Appeals for the 10th Circuit instructed the Service to conduct a full analysis of all of the economic impacts of proposed CHD, regardless of whether those impacts are attributable co-extensively to other causes (New Mexico Cattle Growers Assn v. U.S.F.W.S., 248 F.3d 1277 (10th Cir. 2001)).

[19] In 2004, the U.S. Ninth Circuit invalidated the Service's regulation defining destruction or adverse modification of critical habitat (Gifford Pinchot Task Force v. United States Fish and Wildlife Service). The Service is currently reviewing the decision to determine what effect it (and to a limited extent Center for Biological Diversity v. Bureau of Land Management (Case No. C-03-2509-SI, N.D. Cal.)) may have on the outcome of consultations pursuant to section 7 of the Act.

recovery of endangered and threatened species, as well as the CHD. In this section, the Secretary is required to list species as endangered or threatened "solely on the basis of the best available scientific and commercial data."[20] Section 4 also requires the Secretary to designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat."[21] In addition, under section 4 the Service is required to develop a recovery plan that recommends actions necessary to satisfy the biological needs and assure the recovery of the species. The plan serves as guidance for interested parties, including Federal, State, and local agencies, private landowners, and the general public.

49. The protections afforded to threatened and endangered species and their habitat are described in sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections are the focus of this analysis:

- 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 or result in the destruction or adverse modification of critical habitat. The administrative costs of these consultations, along with the costs of project modifications resulting from these consultations, represent compliance costs associated with the listing of the species and CHD.[22]

- 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, or collect, or to attempt to engage in any such conduct."[23] 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 (i.e., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for an endangered animal species in order to meet the conditions for issuance of an incidental take permit in connection with the development and management of a property.[24] The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately minimized and mitigated. The designation of critical habitat does not require completion of an HCP; however, the designation may influence conservation measures provided under HCPs.

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[20] 16 U.S.C. 1533.

[21] 16 U.S.C. 1533.

[22] The Service notes, however, that a recent Ninth Circuit judicial opinion, *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, has invalidated the Service's regulation defining destruction or adverse modification of critical habitat. The Service is currently reviewing the decision to determine what effect it (and to a limited extent *Center for Biological Diversity v. Bureau of Land Management* (Case No. C-03-2509-SI, N.D. Cal.)) may have on the outcome of consultations pursuant to section 7 of the Act.

[23] 16 U.S.C. 1532.

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

1.2.2 Other Relevant Protection Efforts

50. 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.[25] For the purpose of this analysis, such protective efforts are considered to be co-extensive with the protection offered by critical habitat, and costs associated with these efforts are included in this report. In addition, under certain circumstances, the CHD 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 costs would not have been triggered absent the designation of critical habitat, they are included in this economic analysis. For example, this analysis considers the extent to which the CHD for the plover might trigger additional scrutiny of proposed development projects by the California Coastal Commission.

1.2.3 Additional Analytic Considerations

51. This analysis also considers the potential for other types of economic impacts that can be related to section 7 consultations in general and CHD in particular, including time delay, regulatory uncertainty, and stigma impacts.

Time Delay and Regulatory Uncertainty Impacts

52. Time delays are costs due to project delays associated with the consultation process or compliance with other regulations. Regulatory uncertainty costs occur in anticipation of having to modify project parameters (e.g., retaining outside experts or legal counsel to better understand their responsibilities with regard to CHD).

Stigma Impacts

53. Stigma refers to the change in economic value of a particular project or activity due to negative (or positive) perceptions of the role critical habitat will play in developing, implementing, or conducting that policy. For example, changes to private property values associated with public attitudes about the limits and costs of implementing a project in critical habitat are known as "stigma" impacts.

[25] For example, the Sikes Act Improvement Act (Sikes Act) of 1997 requires Department of Defense (DoD) military installations to develop Integrated Natural Resources Management Plans (INRMPs) that provide for the conservation, protection, and management of wildlife resources (16 U.S.C. §§ 670a - 670o). These plans must integrate natural resource management with the other activities, such as training exercises, taking place at the facility.

1.2.4 Benefits

54. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.[26] 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.[27]

55. In the context of CHD, 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.[28] *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.*

56. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements 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.

57. It is often difficult to evaluate the ancillary benefits of critical habitat designation. To the extent that the ancillary benefits of the rulemaking may be captured by the market through an identifiable shift in resource allocation, they are factored into the overall economic impact assessment in this report. For example, if decreased off-road vehicle use to improve species habitat leads to an increase in opportunities for wildlife viewing or hiking within the region, the local economy may experience an associated measurable, positive impact. Where data are available, this analysis attempts to capture the *net* economic impact (i.e., the increased regulatory burden less any discernable offsetting market gains), of species conservation efforts imposed on regulated entities and the regional economy.

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[26] Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993.

[27] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[28] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

1.2.5 Geographic Scope of the Analysis

58. The geographic scope of the analysis includes areas proposed for CHD, units identified for possible inclusion, and areas proposed for exclusion under section 4(b)(2) of the Act. The economic impacts of potential designation are estimated for each of these three categories of land identified in the proposed rule. The analysis focuses on activities within or affecting these areas.

1.3 Analytic Time Frame

59. The analysis estimates impacts based on activities that are "reasonably foreseeable," including, but not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. This analysis estimates economic impacts to activities from 1993 (year of the species' final listing) to 2025 (21 years from the year of final designation). Forecasts of economic conditions and other factors beyond the next 21 years would be speculative.

1.4 Information Sources

60. The primary sources of information for this report were communications with and data provided by personnel from the Service, Federal action agencies, affected private parties, and local and State governments within California, Oregon, and Washington. Specifically, the analysis relies on data collected in communication with personnel from the following entities:

- U.S. Department of Agriculture, including U.S. Forest Service (USFS);
- U.S. Bureau of Land Management (BLM);
- U.S. Army Corps of Engineers (USACE);
- National Park Service (NPS);
- Camp Pendleton, Vandenberg Air Force Base, and Naval Base Ventura County, Point Mugu;
- The Service;
- California State agencies, including California State Parks, California Department of Fish and Game, and the California Coastal Commission;
- Oregon Parks and Recreation;
- Washington State agencies, including State Parks and Recreation and the Department of Ecology;

- Planning departments in 18 counties and 3 cities in California, Oregon, and Washington;
- A Coos County, Oregon Commissioner;
- Gravel mining entities including Eureka Sand and Gravel, Drake Materials, Mercer-Fraser, Hansen Truckstop Inc., Rock and Gadberry Gravel, and Humboldt County Department of Public Works;
- Private user groups such as Friends of Oceano Dunes and the Surf Ocean Beach Commission; and
- Other private entities potentially impacted, such as legal counsel for the Sand City private development project and Lawson's Landing recreation site, and others.

61. Publicly available data from the Census Bureau and other Department of Commerce data were relied on to characterize the regional economy. In addition, this analysis relies upon the Service's section 7 consultation records, public comments, and published journal sources. The reference section at the end of this document provides a full list of information sources.

1.5 Structure of Report

62. This remainder of this report is organized as follows:

- Section 2: Background and Socioeconomic Overview
- Section 3: Administrative and Implementation Costs of Management Activities
- Section 4: Potential Economic Impacts to Recreation Activities
- Section 5: Potential Economic Impacts to Residential and Related Development
- Section 6: Potential Economic Impacts to Military Installations and Mining Operations
- Appendix A: Small Entity Impacts and Energy Impacts
- Appendix B: Impacts to All Activities by Unit
- Appendix C: Management Impacts by Unit
- Appendix D: Recreational Impacts by Unit

- Appendix E: Development Impacts by Unit
- Appendix F: Impacts on Military Lands by Unit
- Appendix G: Mining Impacts by Unit
- Appendix H: Comparison of Unit Rankings
- References

Sections 3 through 6 are organized by affected activity. For each of these activities, the analysis discusses impacts by proposed critical habitat unit, areas considered for inclusion in critical habitat, and areas proposed for exclusion from critical habitat.

BACKGROUND AND SOCIOECONOMIC OVERVIEW SECTION 2

63. This section provides background on the ecology, geography, and human uses of areas proposed for critical habitat designation (CHD), identified for possible inclusion, and proposed for exclusion (collectively, potential critical habitat). The proposed critical habitat for the plover dots the Pacific coast in three States; California, Oregon, and Washington. The habitat supports a variety of activities, including recreation, military operations, and gravel mining. In addition, residential and commercial development is anticipated in locations adjacent to habitat. The section also summarizes key economic and demographic information for the counties likely to be impacted by the potential critical habitat for the plover.

2.1 Description of Species and Habitat[29]

64. The plover (*Charadrius alexandrinus nivosus*), one of two subspecies of snowy plover to nest in North America, is a small shorebird with pale brown to gray upperparts, gray to black legs and bill, and dark patches on the forehead, behind the eyes, and on either side of the upper breast. The Pacific coast population distinct population segment is defined as those individuals nesting adjacent to tidal waters of the Pacific Ocean, and includes all nesting birds on the mainland coast, peninsulas, offshore islands, adjacent bays, estuaries and coastal rivers.

65. The plover breeds primarily on coastal beaches from southern Washington to southern Baja California, Mexico. The breeding season for plovers extends from early March to late September with birds at more southerly locations nesting earlier in the season than birds located farther north.

66. The plover has experienced population declines over the past century. The proposed rule indicates that destruction and modification of plover habitat have been caused mainly by: human disturbance (e.g., recreational activities such as driving or riding horses on plover beaches); urban development; introduced beachgrass; and expanding predator populations.[30]

[29] The information on the plover and its habitat included in this section was obtained from the U.S. Fish and Wildlife Service, *Proposed Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004.

[30] U.S. Fish and Wildlife Service, *Proposed Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004.

Continuing threats to plover include: development; gravel extraction; encroachment of nonnative vegetation; military activities; and habitat conversion for other special status species.[31,32]

2.2 Background of Western Snowy Plover Critical Habitat Designation

67. The final rule listing the plover as threatened was issued on March 5, 1993. The Environmental Defense Council filed a lawsuit for failure to designate critical habitat in November 1994. On March 2, 1995, the U.S. Fish and Wildlife Service (the Service) published a proposal to designate 28 areas along the coast of California, Oregon, and Washington as critical habitat. The final rule designating 19,474 acres was issued on December 7, 1999. The draft Recovery Plan for the plover was completed in May 2001 and provides a strategy for recovering the bird from threatened status to the point where delisting is warranted.[33]

68. On July 2, 2003, as a result of a suit filed by Coos County, Oregon, the final rule designating critical habitat was remanded and partially vacated by the U.S. District Court for the District of Oregon, and a new analysis of economic impacts ordered. On December 17, 2004**,** the Service proposed to designate 17,299 acres within 35 units as critical habitat. The Service was ordered by the Court to finalize the rule by September 20, 2005.

69. Concurrent with this effort to designate critical habitat, the Service is considering whether to delist the plover. In August 2002, the Surf Ocean Beach Commission of Lompoc, California submitted a petition to delist the plover. The Service published a notice on March 22, 2004 indicating that the petition presented substantial scientific or commercial information indicating that delisting may be warranted. A decision as to whether the petition action is warranted is anticipated for August 2005.

2.3 Proposed Critical Habitat Designation

70. The proposed plover designation includes 17,299 acres within 35 units.[34] The Service proposed critical habitat for portions of plover breeding and wintering habitat in Washington, Oregon, and California. In addition, the Service has identified 1,638 acres of habitat for possible inclusion in critical habitat. These areas are currently unoccupied or were unoccupied at the time of the listing, and the Service requests comment on whether these areas are essential to the conservation of the population. Essential habitat proposed for exclusion pursuant to section 4(b)(2) of the Endangered Species Act (the Act) includes 2,898

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[31] Development in the context of plover protection includes both the construction of homes, resorts, and parking lots adjacent to habitat and private shoreline stabilization structures.

[32] The Draft Recovery Plan also emphasizes shoreline stabilization, dredging and disposal of dredged materials, driftwood removal, beach fires and camping, water course diversion, impoundment, or stabilization, and the operation of salt ponds as causes of the destruction and modification of plover habitat.

[33] U.S. Fish and Wildlife Service, *Western Snowy Plover (Charadrius alexandrinus nivosus) Pacific Coast Population Draft Recovery Plan*, 2001.

[34] U.S. Fish and Wildlife Service, *Proposed Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004.

acres. These six areas are proposed for exclusion, because they are protected by existing conservation and management plans, management plans are being prepared for these areas, or the areas are military installations. Exhibits 2-1 through 2-3 provide maps of the potential critical habitat for the plover. Exhibit 2-4 lists the potential critical habitat areas and presents their acreage.

71. Critical habitat determination considers the "physical and biological features or primary constituent elements (PCEs) essential to the conservation of species, and that may require special management consideration and protection."[35] The PCEs for plover habitat include "sparsely vegetated areas above the daily high water mark, which are undisturbed by humans or animals; sparsely vegetated sandy beach, mud flats, gravel bars, or artificial salt ponds not currently underwater but subject to tidal flow sufficient to support essential food for the plover; and surf- or tide-cast organic debris, which can offer food and shelter."[36]

[35] *Proposed Determination of Critical Habitat for Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608.

[36] Ibid.

Exhibit 2-1

Western Snowy Plover Potential Critical Habitat:
Washington and Oregon Population Density

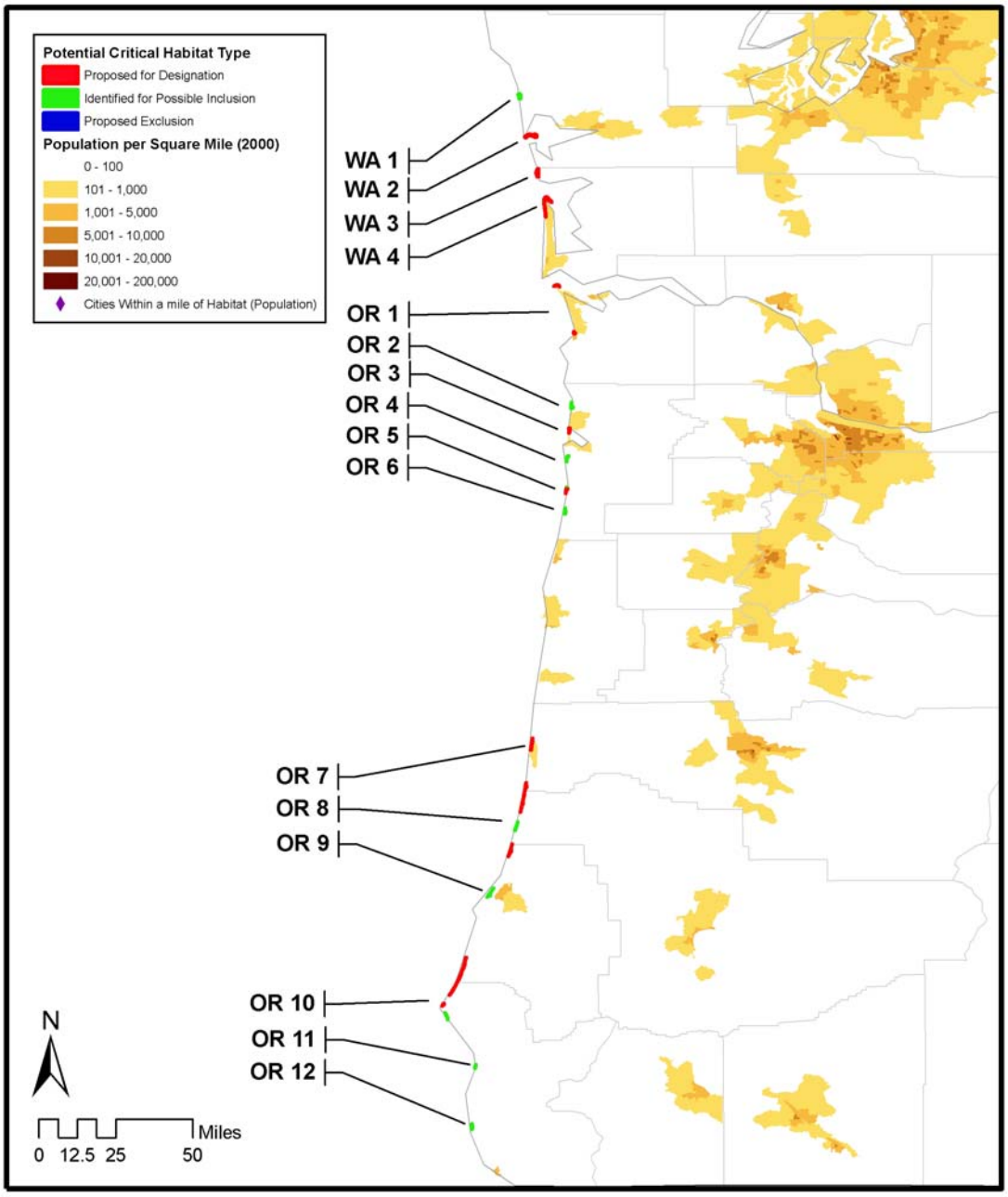

Exhibit 2-2

Western Snowy Plover Potential Critical Habitat:
Northern California Population Density

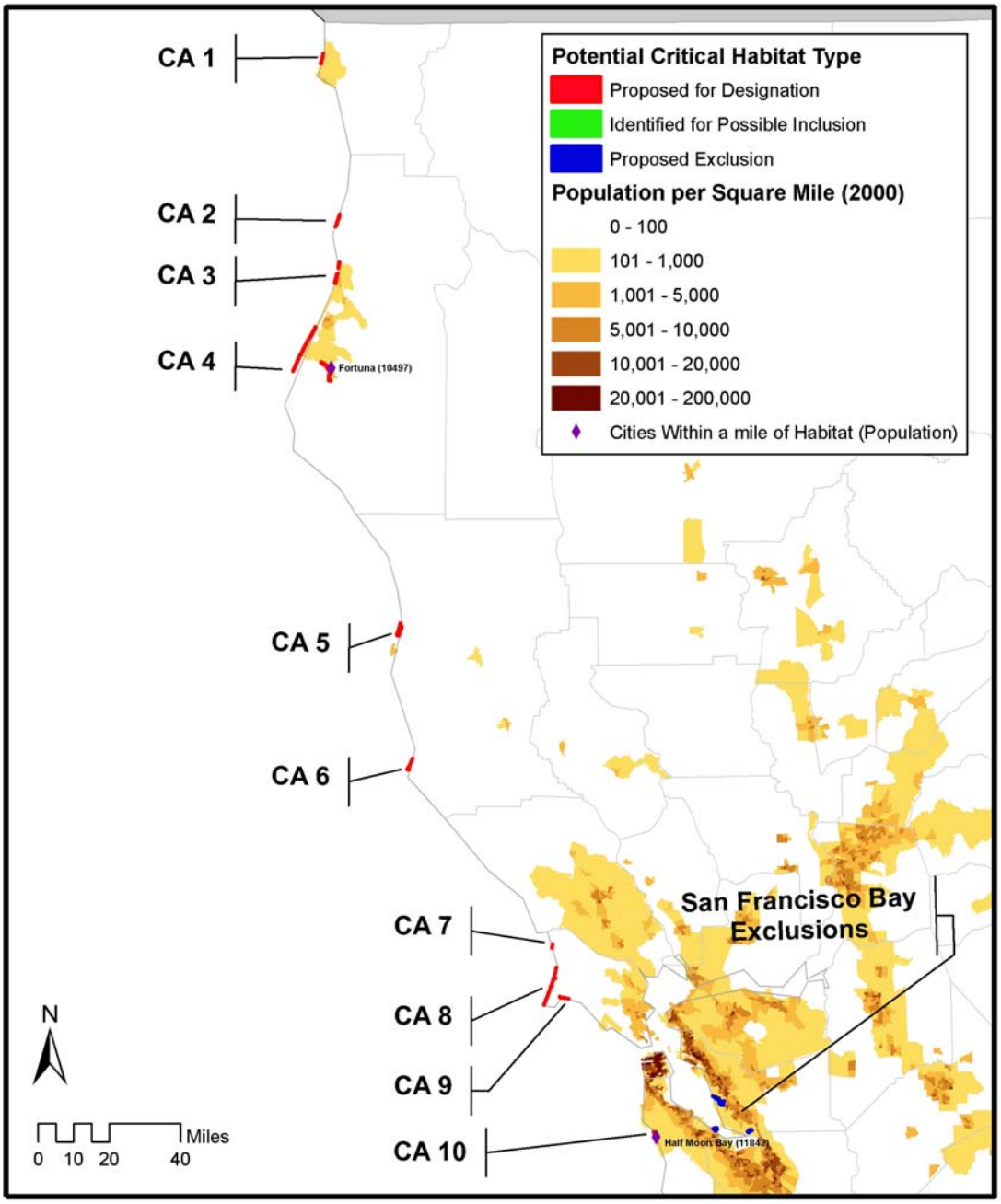

Exhibit 2-3

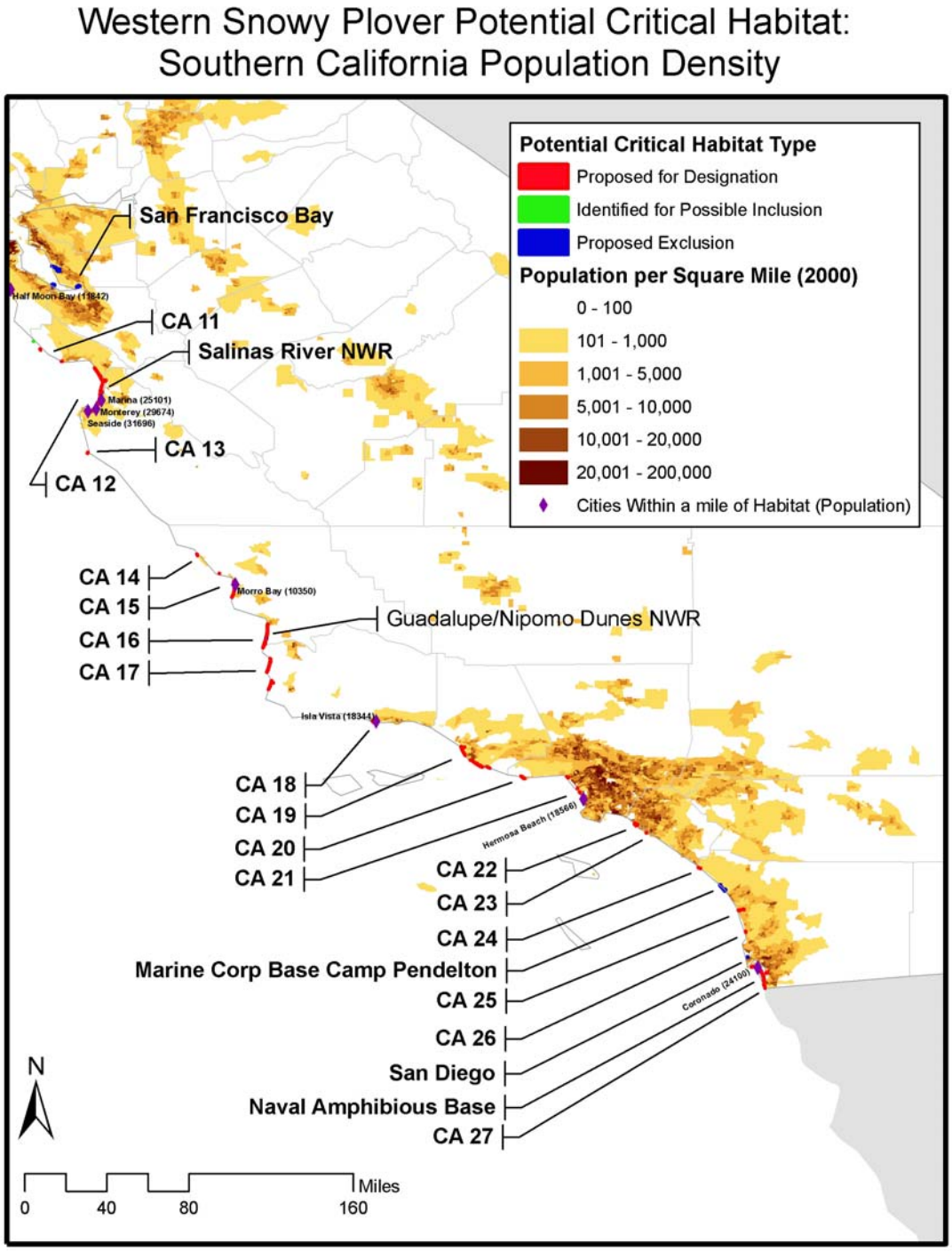
Western Snowy Plover Potential Critical Habitat:
Southern California Population Density
Potential Critical Habitat Type
Proposed for Designation
Identified for Possible Inclusion
Proposed Exclusion
Population per Square Mile (2000)
0 - 100
101 - 1,000
1,001 - 5,000
5,001 - 10,000
10,001 - 20,000
20,001 - 200,000
Cities Within a mile of Habitat (Population)
San Francisco Bay
Half Moon Bay (11842)
CA 11
Salinas River NWR
Marina (25101)
Monterey (29674)
Seaside (31696)
CA 13
CA 12
CA 14
CA 15
CA 16
CA 17
Morro Bay (10350)
Guadalupe/Nipomo Dunes NWR
Isla Vista (18344)
CA 18
CA 19
CA 20
CA 21
Hermosa Beach (18566)
CA 22
CA 23
CA 24
Marine Corp Base Camp Pendelton
CA 25
CA 26
San Diego
Naval Amphibious Base
CA 27
Coronado (24100)
N
Miles
0
40
80
160

Exhibit 2-4

SIZE AND STATUS OF POTENTIAL CRITICAL HABITAT UNITS AND AREAS

Unit/Area	Area in Acres	Status in Proposed Rule
WA 1. Copalis Spit	446.0	Identified for possible Inclusion
WA 2. Damon Pt. Oyhut	908.0	Proposed for designation
WA 3. Midway Beach	786.0	Proposed for designation
WA 4. Leadbetter Pt	1,069.0	Proposed for designation
OR 1A. Columbia River Spit	65.0	Identified for possible Inclusion
OR 1B. Necanicum River Spit	78.0	Identified for possible Inclusion
OR 2. Nehalem River Spit	145.0	Identified for possible Inclusion
OR 3. Bayocean Spit	207.0	Proposed for designation
OR 4. Netarts Spit	143.0	Identified for possible Inclusion
OR 5A. Sand Lake North	38.0	Identified for possible Inclusion
OR 5B. Sand Lake South	104.0	Identified for possible Inclusion
OR 6. Nestucca River Spit	147.0	Identified for possible Inclusion
OR 7. Sutton/Baker Beaches	260.0	Proposed for designation
OR 8A. Siltcoos River Spit	188.0	Proposed for designation
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	375.0	Proposed for designation
OR 8C. N Umpqua River Spit	111.0	Identified for possible Inclusion
OR 8D. Tenmile Creek Spit	235.0	Proposed for designation
OR 9. Coos Bay N Spit	278.0	Proposed for designation
OR 10A. Bandon to Floras Lake	680.0	Proposed for designation
OR 10B. Sixes River Spit	73.0	Identified for possible Inclusion
OR 10C. Elk River Spit	88.0	Identified for possible Inclusion
OR 11. Euchre Creek Spit	75.0	Identified for possible Inclusion
OR 12. Pistol River Spit	116.0	Identified for possible Inclusion
CA 1. Lake Earl	90.8	Proposed for designation
CA 2. Big Lagoon	279.8	Proposed for designation
CA 3A. Clam Beach/Little Riv	155.1	Proposed for designation
CA 3B. Mad River	377.1	Proposed for designation
CA 4A. Humboldt Bay, S Spit	374.7	Proposed for designation
CA 4B. Eel Riv N Spit & Beach	282.5	Proposed for designation
CA 4C. Eel Riv S Spit & Beach	401.5	Proposed for designation
CA 4D. Eel River Gravel Bars	1,192.8	Proposed for designation
CA 5. MacKerricher Beach	1,048.4	Proposed for designation
CA 6. Manchester Beach	341.0	Proposed for designation
CA 7. Dillon Beach	29.6	Proposed for designation
CA 8. Pt Reyes Beach	461.8	Proposed for designation
CA 9. Limantour Spit	123.5	Proposed for designation
CA 10. Half Moon Bay	36.7	Proposed for designation
CA 11A. Waddell Cr Beach	9.3	Identified for possible Inclusion
CA 11B. Scott Cr. Beach	18.6	Proposed for designation
CA 11C. Wilder Cr. Beach	10.3	Proposed for designation
CA 12A. Jetty Rd to Aptos	272.1	Proposed for designation
CA 12B. Elkhorn Sl Mudflat	280.7	Proposed for designation
CA 12C. Monterey to Moss Lnd	802.6	Proposed for designation
CA 13. Pt Sur Beach	60.9	Proposed for designation

Exhibit 2-4

SIZE AND STATUS OF POTENTIAL CRITICAL HABITAT UNITS AND AREAS

Unit/Area	Area in Acres	Status in Proposed Rule
CA 14. San Simeon Beach	27.6	Proposed for designation
CA 15A. Villa Cr Beach	16.7	Proposed for designation
CA 15B. Atascadero Beach	143.8	Proposed for designation
CA 15C. Morro Bay Beach	611.3	Proposed for designation
CA 16. Pismo Beach/Nipomo	1,268.6	Proposed for designation
CA 17A. Vandenberg North	625.7	Proposed for designation
CA 17B. Vandenberg South	303.5	Proposed for designation
CA 18. Devereaux Beach	35.9	Proposed for designation
CA 19A. Mandalay to Santa Clara	349.8	Proposed for designation
CA 19B. Ormond Beach	203.2	Proposed for designation
CA 19C. Mugu Lagoon	321.0	Proposed for designation
CA 19D Mugu Lagoon South	87.0	Proposed for designation
CA 20. Zuma Beach	68.0	Proposed for designation
CA 21A. Santa Monica Beach	25.0	Proposed for designation
CA 21B. Dockweiler N	43.0	Proposed for designation
CA 21C. Dockweiler S	24.0	Proposed for designation
CA 21D. Hermosa Beach	10.0	Proposed for designation
CA 22A. Bolsa Chica Reserve	591.0	Proposed for designation
CA 22B. Huntington St. Beach	13.0	Proposed for designation
CA 23. Santa Ana River Mouth	4.0	Proposed for designation
CA 24. San Onofre St Beach	58.0	Proposed for designation
CA 25A Batiquitos West	21.3	Proposed for designation
CA 25B. Batiquitos Middle	22.9	Proposed for designation
CA 25C. Batiquitos East	20.5	Proposed for designation
CA 26. Los Penasquitos	24.0	Proposed for designation
CA 27A. North Island N.	116.7	Proposed for designation
CA 27B. North Island S.	68.2	Proposed for designation
CA 27C. Silver Strand	174.0	Proposed for designation
CA 27D. Delta Beach	85.3	Proposed for designation
CA 27E. Sweetwater NWR	128.0	Proposed for designation
CA 27F. Tijuana River Beach	182.4	Proposed for designation
Ex 1. Salinas River National Wildlife Refuge	142.0	Proposed for exclusion
Ex 2. Guadalupe/Nipomo Dunes National Wildlife Refuge	235.0	Proposed for exclusion
Ex 3. San Diego	23.0	Proposed for exclusion
Ex 4. Marine Corps Base Camp Pendleton	507.0	Proposed for exclusion
Ex 5. Naval Amphibious Base	144.0	Proposed for exclusion
Ex 6. San Francisco Bay	1,847.0	Proposed for exclusion
Total of all Units/Areas	**21,836.2**	
Total Proposed for Designation	*17,299.9*	
Total Identified for Possible Inclusion	*1,638.3*	
Total Proposed for Exclusion	*2,898.0*	

Source: *Proposed Determination of Critical Habitat for Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004.

72. Of the 21,836 acres of plover habitat considered in the proposed rule, approximately 79 percent are proposed as critical habitat, eight percent are identified for possible inclusion, and 13 percent are proposed for exclusion. Of the total critical habitat acres proposed for designation, 26 percent are Federal lands, 51 percent are State lands, and the remaining 23 percent are private lands. Of the plover habitat identified for possible inclusion, nine percent is federal land, 75 percent is State land, and 16 percent is private land. Finally, of the habitat proposed for possible exclusion by the Service, 67 percent is Federal and 33 percent is State land. Exhibit 2-5 presents land ownership by State within the potential critical habitat.

Exhibit 2-5

SUMMARY OF ESTIMATED LAND OWNERSHIP IN POTENTIAL PLOVER CRITICAL HABITAT (Acres)

State		Land Ownership			
		Federal	**State**	**Private**	**Total**
California	Total Proposed	2,444	6,774	3,095	12,314
	Total Possible Inclusion	0	8	1	9
	Total	2,444	6,782	3,097	12,323
	Total Proposed for Exclusion	1,952	947	0	2,898
Oregon	Total Proposed	1,742	318	163	2,223
	Total Possible Inclusion	139	777	267	1,183
	Total	1,881	1,095	430	3,406
Washington	Total Proposed	270	1,801	692	2,763
	Total Possible Inclusion	0	446	0	446
	Total	270	2,247	692	3,209
TOTAL	**Total Proposed**	**4,456**	**8,893**	**3,950**	**17,300**
	Total Possible Inclusion	**139**	**1,231**	**268**	**1,638**
	Total	**4,595**	**10,124**	**4,219**	**18,938**
	Total Proposed for Exclusion	**1,952**	**947**	**0**	**2,898**

Source: *Proposed Determination of Critical Habitat for Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004.

Note: Acreage estimates obtained from unit descriptions in the proposed rule. Totals may not sum due to rounding.

73. Certain types of activities occurring within the proposed habitat are likely to be impacted by efforts to protect the plover. Exhibit 2-6 identifies potentially affected activities by landowner. These activities are discussed in detail in the following sections.

Exhibit 2-6

ACTIVITIES OCCURRING WITHIN POTENTIAL CRITICAL HABITAT FOR THE PLOVER

Land Owners/Managers	Potentially Affected Activities
Army Corps of Engineers	Recreation, Habitat Management
Bureau of Land Management	Recreation, Residential and Commercial Development, Habitat Management
California Department of Fish and Game	Recreation, Residential and Commercial Development, Habitat Management
California Department of Parks and Recreation (CA Parks)	Recreation, Residential and Commercial Development, Habitat Management
California State Lands Commission	Residential and Commercial Development, Gravel Mining, Habitat Management
California Coastal Commission	Recreation, Residential and Commercial Development, Gravel Mining, Habitat Management
Counties	Recreation, Residential and Commercial Development, Gravel Mining, Habitat Management
National Park Service	Habitat Management
Oregon Parks and Recreation Department	Recreation, Residential and Commercial Development, Habitat Management
Private	Recreation, Residential and Commercial Development, Habitat Management
Sand City Redevelopment Authority, CA	Recreation, Residential and Commercial Development, Habitat Management
Santa Barbara County, California	Recreation, Habitat Management
U. S. Forest Service	Recreation, Habitat Management
U.S. Fish and Wildlife Service	Recreation, Residential and Commercial Development, Habitat Management
U.S. Air Force	Recreation, Military
U.S. Marine Corps	Recreation, Residential and Commercial Development, Habitat Management
U.S. Navy	Recreation, Military, Residential and Commercial Development
University of California, Santa Barbara	Recreation, habitat management
Washington Department of Fish and Wildlife	Residential and Commercial Development, Habitat Management
Washington Department of Natural Resources	Residential and Commercial Development, Habitat Management
Washington State Parks	Residential and Commercial Development, Habitat Management

Sources:. *Proposed Determination of Critical Habitat for Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004.

2.4 Socioeconomic Profile of the Critical Habitat Area

74. This section summarizes key economic and demographic information for the counties containing potential critical habitat for the plover, including population characteristics and general economic activity. County-level data are presented to provide context for the discussion of potential economic impacts, and to highlight trends that may influence these impacts. Although county-level data may not precisely reflect the socioeconomic characteristics of the areas immediately surrounding potential critical habitat for the plover, these data provide context for the broader analysis.

2.4.1 Population Characteristics

75. Potential critical habitat dots the coastline of California, Oregon, and Washington. Exhibit 2-7 presents the population size, change in population from 1990 to 2000, per capita income, and poverty rates for the 22 counties that have potential critical habitat within their boundaries, and for each of the three States as a whole.

76. The counties containing potential critical habitat in California account for over 50 percent of the State population. For the most part, the per-capita income in California counties containing proposed habitat is close to the State average of approximately $23,000. However, the per-capita income in Humboldt and Del Norte Counties is lower ($17,000 and $15,000 respectively), and higher in Marin, San Mateo, and San Francisco Counties ($45,000, $36,000, and $35,000 respectively). The State poverty rate is 14 percent, and like per capita income, most counties containing potential critical habitat have poverty rates within a few percentage points of the State average. The poverty rate in Del Norte and Humboldt Counties, however, is 20 percent, while the rate is seven percent, six percent, and nine percent in Marin, San Mateo, and Ventura Counties respectively.

77. The Oregon Counties containing potential critical habitat account for 17 percent of the State population. In Oregon, the per-capita income is approximately $21,000 and in most of the counties containing potential critical habitat, it is only slightly lower than the State average. However, in Coos, Curry, and Douglas Counties, the per-capita income is several thousand dollars below the State average, $18,000 in both Coos and Curry Counties and $17,000 in Douglas County. The poverty rate in Oregon State is 12 percent, while the poverty rate in the counties with potential critical habitat ranges from 11 to 15 percent.

78. The population in the two Washington counties containing potential critical habitat makes up one percent of the total State population. The per-capita income for Washington is higher than the per-capita income in both counties containing proposed habitat, Grays Harbor and Pacific Counties. The State per-capita income is approximately $23,000, while per-capita income is $17,000 in both Grays Harbor and Pacific Counties, 25 percent lower than the State average. Likewise, the poverty rate is lower on average in the State than in Grays Harbor and Pacific Counties. The poverty rate for Washington is 11 percent. By comparison, the poverty rate is 16 percent and 14 percent, respectively, in Grays Harbor and Pacific Counties.

Exhibit 2-7

SOCIOECONOMIC PROFILE OF COUNTIES CONTAINING CRITICAL HABITAT FOR THE PLOVER

State	County	Population Density (persons/ sq mi)	Population (2000)	Percent of Statewide Population	Percent Change (1990-2000)	Per Capita Income (1999)	Poverty Rate (1999)
California	**State Total**	**217.2**	**33,871,648**	**100%**	**14%**	**$22,711**	**14%**
	Del Norte	27.3	27,507	<1%	17%	$14,573	20%
	Humboldt	35.4	126,518	<1%	6%	$17,203	20%
	Los Angeles	2,344.2	9,519,338	28%	7%	$20,683	18%
	Marin	475.7	247,289	1%	7%	$44,962	7%
	Mendocino	24.6	86,265	<1%	7%	$19,443	16%
	Monterey	120.9	401,762	1%	13%	$20,165	14%
	Orange	3,605.6	2,846,289	8%	18%	$25,826	10%
	San Diego	670	2,813,833	8%	13%	$22,926	12%
	San Francisco	16,634.4	776,733	2%	7.3%	$34,556	11%
	San Luis Obispo	74.7	246,681	1%	14%	$21,864	13%
	San Mateo	1,574.7	707,161	2%	9%	$36,045	6%
	Santa Barbara	145.9	399,347	1%	8%	$23,059	14%
	Santa Cruz	574.1	255,602	1%	11%	$26,396	12%
	Ventura	408.2	753,197	2%	13%	$24,600	9%
Oregon	**State Total**	**35.6**	**3,421,399**	**100%**	**20%**	**$20,940**	**12%**
	Clatsop	43.1	35,630	1%	7%	$19,515	14%
	Coos	39.2	62,779	2%	4%	$17,547	15%
	Curry	13	21,137	1%	9%	$18,138	12%
	Douglas	19.9	100,399	3%	6%	$16,581	13%
	Lane	70.9	323,950	9%	15%	$19,681	14%
	Tillamook	22	24,262	1%	12%	$19,052	11%
Washington	**State Total**	**88.6**	**5,894,121**	**100%**	**21%**	**$22,973**	**11%**
	Grays Harbor	35.1	67,194	1%	5%	$16,799	16%
	Pacific	22.5	20,984	<1%	11%	$17,322	14%

Source: U.S. Census Bureau, Census 2000 and State County QuickFacts, accessed at http://quickfacts.census.gov/qfd.

2.4.2 Economic Activity

79. The respective contributions of the various economic sectors in potential critical habitat counties provide insight into the activities most likely to experience impacts. Exhibit 2-8 highlights the annual payroll for and number of establishments in various industries in the 22 counties containing potential critical habitat for the plover. The "Number of Establishments" column displays the total number of physical locations at which business activities were conducted with one or more paid employee in the year 2002. These figures provide a measure of the density of commercial and industrial establishments in the region.

80. The principal industries, in terms of annual payroll and number of establishments, include services, retail trade, finance and insurance, manufacturing and construction.[37] Annual payroll from all industries in the counties containing potential critical habitat totaled more than $320 billion in 2002. Over 520,000 business establishments operate in the counties containing potential critical habitat for the plover. Establishments in the services sector represent almost 50 percent of the total establishments in the counties with potential critical habitat. Retail trade establishments represent an additional 13 percent of total establishments in the area.

Exhibit 2-8

ECONOMIC ACTIVITY WITHIN COUNTIES CONTAINING PLOVER HABITAT ANNUAL PAYROLL AND NUMBER OF ESTABLISHMENTS BY INDUSTRY (2002)

	California		Oregon		Washington	
Industry	**Annual Payroll (000)**	**Number of Establishments**	**Annual Payroll (000)**	**Number of Establishments**	**Annual Payroll (000)**	**Number of Establishments**
Agriculture, Forestry, Hunting, and Fishing	$245,915	926	$166,990	553	$54,538	158
Mining	$267,142	342	$12,016	25	$0	3
Utilities	$1,396,857	541	$19,889	42	$320	8
Construction	$16,089,799	35,513	$345,337	1,891	$40,330	287
Manufacturing	$39,641,454	30,718	$1,066,510	902	$144,357	132
Wholesale Trade	$25,097,521	40,272	$272,242	723	$22,495	75
Retail Trade	$22,762,045	64,733	$629,930	2,666	$73,714	409
Transportation and Warehousing	$10,019,515	10,261	$125,433	506	$13,621	136
Information	$22,416,250	14,883	$126,085	287	$15,132	29
Finance and Insurance	$32,111,908	28,870	$342,027	879	$23,670	120
Real Estate	$7,368,379	26,998	$70,092	828	$5,080	102
Auxiliaries	$135,949,638	246,338	$27,427	23	$0	1
Unclassified	$2,114,391	793	$517	74	$95	9
Services and Other Industries	$90,555	2,602	$1,929,851	7,389	$170,832	1,088
Total	**$315,943,041**	**503,790**	**$5,149,003**	**16,788**	**$568,978**	**2,557**

Source: U.S. Census Bureau, *2001 County Business Patterns*, accessed at http://censtats.census.gov/cbpnaic/cbpnaic.shtml.

Note: Totals may not sum due to rounding.

81. Exhibit 2-9 provides employment data for all counties that contain potential critical habitat for the plover. The largest employment sectors are manufacturing, retail and wholesale trade, service, and government. More than 8.7 million people are employed in the counties containing habitat. Employment within the services sector represented approximately 38 percent of the job base while employment within the retail and wholesale

[37] Services sectors include professional, scientific & technical services; management of companies and enterprises; admin, support, waste management, remediation services; educational services; health care and social assistance; arts, entertainment & recreation; accommodation & food services; and other services (excluding public administration).

trade constituted 15 percent of all jobs in the counties. Government employment accounted for 15 percent of all jobs, while manufacturing employment accounted for 11 percent.

Exhibit 2-9

ECONOMIC ACTIVITY WITHIN COUNTIES CONTAINING PLOVER HABITAT NUMBER OF EMPLOYEES BY INDUSTRY (2003)

Industry	California	Oregon	Washington
Agriculture	122,950	8,509	1,015
Construction and Mining	397,950	13,760	2,288
Manufacturing	912,240	30,570	4,206
Transportation and Public Utilities	285,090	6,440	762
Retail and Wholesale Trade	1,294,700	36,460	4,252
Information	335,920	4,620	1,358
Finance, Insurance, and Real Estate	582,100	11,020	N/A
Services	3,238,430	81,270	8,029
Government	1,282,860	45,810	8,236
Total Employment	**8,452,240**	**238,459**	**30,144**

Sources: California Employment Development Department, http://www.labormarketinfo.edd.ca.gov/cgi/dataanalysis/labForceReport.asp?menuchoice=LABFORCE; Washington Labor Market and Economic Analysis Branch, http://www.workforceexplorer.com/cgi/dataanalysis/?PAGEID=94; Oregon Employment Department, http://www.qualityinfo.org/olmisj/labforce; and Bureau of Economic Analysis (Oregon and Washington Agriculture data only), http://www.bea.doc.gov/bea/regional/reis/.

2.4.3 Importance of Beach Recreation and Tourism

82. Approximately three-quarters of the beaches considered in this report provide recreational opportunities to the public. Potential beach users include local residents of the areas adjacent to coast and inland residents of California, Oregon, and Washington, as well as tourists from across the United States and foreign countries. This section provides a general discussion of the importance of beach recreation and tourism to the economies of these three States.

<u>California</u>

83. According to a report prepared for the California Travel and Tourism Commission and the Division of Tourism, California Technology, Trade and Commerce Agency, "the travel industry is one of the most important segments of the California economy. Locations and attractions throughout the state enjoy a national and international reputation, comprising one of the most active visitor destinations in North America."[38] Dean Runyan Associates estimate that the Gross State Product (GSP) of the California travel industry is $37.8

[38] Dean Runyan Associates, *The Economic Significance of the California Travel Industry: Gross State Product Industry Comparison; Small Business and Rural Economic Development; Direct, Secondary and Total Impacts*, prepared for California Tourism (A Joint Marketing Venture of the California Travel and Tourism Commission and the Division of Tourism, California Technology, Trade and Commerce Agency), July 2003, p. 1.

billion.[39] They estimate that approximately 40 to 50 percent of all visitor spending in California comes from out-of-state residents and international visitors.[40] Compared with other important industries in California that primarily sell their products outside of the local or regional economy, GSP for the travel industry is similar in size to the electronic equipment industry and the agriculture and food processing industry, and is larger than the industrial machinery, motion picture, and instrument industries.[41] Tourism is especially important to small businesses and rural areas, because the majority of employees working in travel-related industries are employed by small businesses, and travel-generated earnings are four times as high in rural areas as in urbanized areas.[42]

84. California beaches are a tourist attraction and contribute to the travel industry's GSP. Dr. Philip King of San Francisco State University conducted a survey for the California Department of Boating and Waterways of nine Southern California beach locations in San Diego, Orange, Los Angeles, and Santa Barbara Counties. The study examined the number of people visiting beaches and the economic impact of these visits to the State and national economy.[43] The study provides insight into the types of visitors using California's beaches and the amount of money they spend at local establishments when they visit the beach.

85. Dr. King focuses on beaches in Southern California, because these sites attract more out-of-state and foreign visitors. Despite this bias, on average, local residents taking day-trips to the surveyed beaches account for approximately 64 percent of visitors, out-of-state visitors account for 18 percent of the beach population, vacationers from within California account for 12 percent of visitors, and the remaining six percent are foreigners. For less well-known beaches in southern and central California, Dr. King assumes that 77 percent of annual attendance results from local residents taking day-trips, 11 percent are California vacationers, 10 percent are out-of-state vacationers, and two percent are foreigners.

86. King estimates that in total, California beaches experience 238 million visitor days per year.[44] Of this total, 232 million visitor days, or 97 percent, occur at beaches south of San Francisco. Exhibit 2-10 provides Dr. King's estimates of the annual spending for gas and auto, food, alcohol, parking, sundries, and lodging for each beach surveyed and for the rest of the beaches in central and southern California. We note that we are unable to determine based on available information whether King's estimate of spending reported in this exhibit is directly comparable to measures of GSP provided in the Dean Runyan Associates study discussed above. However, the survey results indicate that approximately half of beach-related recreation spending in southern and central California comes from local residents taking day-trips to beaches. No information is available regarding the types of visitors using beaches in northern California. However, King suggests that "beaches in

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[39] Ibid, p. 6. GSP includes the market value of the goods and services produced by the labor and property located in a State. It is smaller than total sales for the industry, because it measures only the "value added of an industry and does not include the cost of certain inputs that are necessary for production."

[40] Ibid, p. 8.

[41] Ibid, p. 9.

[42] Ibid, p. ii.

[43] King, Philip, *The Potential Loss in Gross National Product and Gross State Product from a Failure to Maintain California's Beaches*, prepared for the California Department of Boating and Waterways, Fall 2003.

[44] Ibid, p. 7.

northern California…are not suitable for swimming and thus do not attract the type of vacationers and day-trippers that beaches to the south do."[45]

Exhibit 2-10

ANNUAL BEACH ATTENDANCE AND ANNUAL SPENDING BY VISITOR TYPES IN CALIFORNIA

Location[1]	**Annual Attendance**	**CA Day-trippers**	**CA Vacationers**	**Out-of-State Vacationers**	**Foreign Vacationers**	**Total**
Carpinteria State and City Beach (Santa Barbara County)	2 million	$14 million	$27 million	$8 million	$2 million	$51 million
Encinitas's main beach (north San Diego County)	5 million	$56 million	$26 million	$37 million	$6 million	$125 million
Huntington Beach (Orange County)	10 million	$179 million	$18 million	$66 million	$11 million	$274 million
Mission Beach (San Diego County)	3 million	$44 million	$23 million	$54 million	$12 million	$133 million
San Clemente (Orange County)	2 million	$23 million	$12 million	$12 million	$2 million	$50 million
Santa Barbara City beach (Santa Barbara County)	400,000	$5 million	$3 million	$4 million	$2 million	$14 million
Venice Beach (Los Angeles County)	8 million	$118 million	$20 million	$108 million	$97 million	$343 million
Other Southern and Central CA beaches (not surveyed)	202 million	$3.2 billion	$1.1 billion	$1.2 billion	$160 million	$5.7 billion
Total[2]	**232 million**	**$3.7 billion**	**$1.3 billion**	**$1.5 billion**	**$290 million**	**$6.7 billion**

Source: King, Philip, *The Potential Loss in Gross National Product and Gross State Product from a Failure to Maintain California's Beaches*, prepared for the California Department of Boating and Waterways, Fall 2003, pp. 15 to 16.

Notes:
1. Less than one mile of Huntington Beach is proposed for critical habitat designation; the remaining beaches surveyed are not included in the proposed rulemaking.
2. Totals may not sum due to rounding.

[45] Ibid., p. 7.

Oregon

87. In a report prepared for the Oregon Tourism Commission, Dean Runyan Associates analyze the economic significance of the travel industry in the State between 1991 and 2004.[46] It estimates the direct impacts of travel spending in each county and estimates secondary (indirect and induced) impacts (e.g., employment, earnings) at a State level. Almost all types of travel, such as travel for business, pleasure, shopping, attending meetings, or for personal, medical, or educational purposes, are included in the analysis; however, commuting and routine travel within Oregon are excluded.

88. The authors estimate that total direct travel spending in Oregon in 2004 was $6.9 billion.[47] The largest share of visitor spending was on food or beverages services.[48] The study notes that growth in travel industry employment State-wide between 2003 and 2004 was 1.8 percent, which is below the average annual increase of 2.5 percent since 1991. Dean Runyan Associates attribute this difference, in part, to "the fact that many businesses in the travel industry have been operating below capacity for several years."[49]

89. Exhibit 2-11 presents direct visitor spending in 2003 by county. The authors note that "[i]n general, rural areas of Oregon are more dependent on tourism than urban areas, even though the latter have higher absolute levels of tourism spending. The five counties with the highest ratio of travel-generated earnings to total earnings were Clatsop, Curry, Lincoln, Tillamook and Wasco."[50]

Exhibit 2-11

DIRECT TRAVEL SPENDING BY VISITORS IN OREGON COUNTIES IN 2003

Counties With Potential Critical Habitat	Visitor Spending at Destination in 2003[a]
Clatsop	$182.2 million
Tillamook	$83.7 million
Lincoln	$197.3 million
Lane	$261.4 million[b]
Douglas	$103.6 million[c]
Coos	$77.3 million
Curry	$67.2 million

Source: Dean Runyan Associates, "Oregon Travel Impacts, 1991-2004p: Statewide Preliminary Estimates: Detailed County Estimates," prepared for the Oregon Tourism Commission, January 2005, pp. 42 to 85.

Notes:
(a) Spending estimate does not include spending on "other travel," defined as resident air travel and travel agency services.
(b) Spending in Western Lane County is approximately 24 percent of total spending in the County.
(c) Spending in Western Douglas County is approximately 37 percent of total spending in the County.

[46] Dean Runyan Associates, "Oregon Travel Impacts, 1991-2004p: Statewide Preliminary Estimates: Detailed County Estimates," prepared for the Oregon Tourism Commission, January 2005.
[47] Ibid., p. 11.
[48] Ibid., p. 11.
[49] Ibid., p.14.
[50] Ibid., p. v.

90. The travel spending estimates presented above include visits to a variety of destinations within Oregon, such as Portland, Columbia River Gorge, inland camping, hiking, hunting, and fishing sites, and beaches along Oregon's coast. Although no information is available about the percent of travel spending occurring in beach communities, a 2001 survey of beach users for the Oregon Parks and Recreation Department (OPRD) provides additional information about the number of people visiting Oregon's beaches and the types of recreational activities undertaken at these sites.[51] The study area surveyed included portions of the beaches limited to OPRD's jurisdiction. The study authors estimate that on average 7,104 people visit the coastal beaches per day on weekends, and 3,925 people per day visit on weekdays (average use levels range from 18 visitors per mile to 33 visitors per mile depending on the day).[52] In general, approximately 80 percent of beach users visit beaches in the northern half of the coast (Newport to the Columbia River); the remaining 20 percent use beaches in the southern half of the coast (South Beach to Brookings).[53] The most common activities observed along the coast were "relaxing in a stationary location (43%) [of users surveyed] and walking (25%)…[n]o other activity accounted for more than 65 of the observations."[54]

Washington

91. Information on the importance of tourism and/or beach recreation to the Washington economy was not readily available at the writing of this report. However, in 2002, Dean Runyan Associates prepared a report on the economic impacts of visitors to Washington State parks for the Washington State Parks and Recreation Commission.[55] The study includes both in-state and out-of-state visitors and estimates that between 15 and 20 percent of all visitation in the State is related to outdoor recreation.[56] The authors estimate that outdoor recreation represented 13.7 million visitor days in 2002, or about nine percent of all visitor days in the State that year (148.9 million).[57] Outdoor recreators spent $1.5 billion that year, or approximately 17 percent of all visitor spending in the State ($8.8 billion).[58]

92. Dean Runyan Associates report that approximately one-half of all recreation visits to public lands by Washington residents are to local public lands and one-quarter are to State lands.[59] However, "average trip and travel expenditures are probably…greatest for visitors to federally-managed lands and lowest for local public lands," because federally-managed sites receive a higher percentage of visitors traveling more than 50 miles from home.[60] In

[51] Shelby, Bo and John Tokarczyk, "Oregon Shore Recreational Study," prepared for OPRD, June 2002.
[52] Ibid., p. 11.
[53] Ibid., p. 12.
[54] Ibid., p. 14.
[55] Dean Runyan Associates, "Washington State: Economic Impacts of Visitors to Washington State Parks," prepared for Washington State Parks and Recreation Commission, June 2002.
[56] Ibid., pp. 4 to 5.
[57] Ibid., p. 5.
[58] Ibid., p. 5.
[59] Ibid., p. 8.
[60] Ibid., p. 8.

2000, trips to State parks resulted in expenditures of $64.8 million in Grays Harbor County and $45.3 million in Pacific County.[61]

[61] Ibid., p. 14.

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ADMINISTRATIVE AND IMPLEMENTATION COSTS OF MANAGEMENT ACTIVITIES SECTION 3

93. This section analyzes past and future economic impacts associated with plover management activities, including the development and administration of habitat conservation plans (HCPs) and resource management plans. The administrative costs associated with section 7 consultation for the plover are also discussed in this section. Administrative costs associated with the preparation of HCPs for particular residential and commercial development projects and Integrated Natural Resource Management Plans (INRMPs) are discussed in Section 5 (Potential Economic Impacts to Residential and Related Development) and Section 6 (Potential Economic Impacts to Military Facilities and Mining Operations), respectively.

94. This Section is divided into three parts. First, it summarizes the impacts of implementing management efforts in areas proposed for critical habitat designation (CHD), considered for possible inclusion, or proposed for exclusion (collectively referred to as potential critical habitat). Next, the Section describes costs of existing and proposed habitat management activities by geographic region and management entity. Finally, it summarizes the administrative costs of past and future section 7 consultations. This section focuses on administrative and management costs borne by Federal, State, and local agencies, as well as private land managers. The impacts of these management actions on recreational beach use are discussed in Section 4 (Potential Economic Impacts to Recreation Activities) of this report.

95. Plover management actions have been undertaken in California, Oregon, and Washington since before the listing of the species in 1993. Exhibit 3-1 presents a timeline of historical management actions and regulatory milestones that have provided protection to plover and its habitat.

Exhibit 3-1

TIMELINE OF PAST PLOVER-RELATED MANAGEMENT ACTIONS AND REGULATORY MILESTONES

Management Actions	
1984	• Begin regular monitoring of plovers in Monterey Bay, California
1990	• Exclosures erected in Montery Bay and Pismo/Oceano
1991	• Fencing of 20 acres of snowy plover nesting habitat at dredging spoils area at OR-9
1994	• Oregon Fish and Wildlife Commission adopts plover conservation program • BLM begins 175-acre plover habitat restoration project (OR-9)
1995	• Symbolic fencing and nest exclosures erected at OR-7, OR-8A, OR-8D, and OR-10A by Forest Service • In Oregon, the Nature Conservancy prepares plover site management plans for Bayocean Spit, Sutton Beach, Siltcoos River, Tahkenitch North and South Spits, Tenmile South Spit and Estuary, Coos Bay North Spit, Bandon Beaches, and New River Mouth to Floras Lake/New River Overwash • Oregon Dunes National Recreation Area Management Plan published (OR-8A, OR-8B, OR-8C, and OR-8D) • Forest Service begins invasive species control at Siuslaw National Forest and Oregon Dunes National Recreation Area (OR-&, OR-8A, OR-8B, OR-8C, and OR-8D) • Management of Moss Landing Wildlife Area salt ponds begins for plover (e.g., draw-down of water and flooding) (CA-12B) • Washington State Recovery Plan for the plover published • Coos Bay Shorelands Final Management Plan published (OR-9) • Tijuana Slough National Wildlife Refuge Comprehensive Management Plan published (CA-27F)
1997	• Symbolic fencing and nest exclosures erected at OR-10A • City of San Diego Multiple Species Subarea Plan is approved (CA-25, CA-26, CA-27D, CA-27E, and CA-27F)
1998	• BLM begins 160 acre plover habitat restoration project (OR-10A) • BLM begins fencing plover habitat restoration area (OR-9)
1999	• New Carissa groundings result in increased plover management (OR-9) • Driving restrictions implemented at OR-9
2000	• Vandenberg Air Force Base closes recreational beach (CA-17A and CA-17B) • Oceano Dunes State Vehicular Recreation Area settles lawsuit with Sierra Club on plover management • Guadalupe-Nipomo Dunes National Wildlife Refuge Conceptual Management Plan finalized
2001	• Draft Plover Recovery Plan published • Coal Oil Point Management Plan published (CA-18) • Predator management begins at OR-9 and OR-10A • Exclosures erected at Guadalupe-Nipomo Dunes National Wildlife Refuge (proposed for exclusion) • Construction of symbolic fencing at CA-16
2002	• California Department of Parks and Recreation publishes plover systemwide management guidelines-symbolic fencing, exclosures, etc. targeted for beaches identified in the Recovery Plan • Predator Damage Management Environmental Assessment published by the U.S. Fish and Wildlife Service (Service), BLM, and Forest Service • Salinas River National Wildlife Refuge Comprehensive Conservation Plan published (proposed for exclusion) • Exclosures erected at CA-3A, CA-4A, CA-4B, CA-6, CA-11C, CA-12A, CA-16, and CA-19A • Construction of symbolic fencing at CA-10, CA-12A, CA-14, CA-15A, CA-15B, CA-15C, and CA-27C
2003	• Driving restrictions begin on CA-3A, CA-3B, and CA-4A • Moss Landing Wildlife Area Management Plan published (CA-12C) • Exclosures erected at Salinas River National Wildlife Refuge (proposed for exclusion) • Construction of symbolic fencing occurs at CA-11C and CA-19A

Exhibit 3-1 TIMELINE OF PAST PLOVER-RELATED MANAGEMENT ACTIONS AND REGULATORY MILESTONES	
2004	• Draft HCP for Oregon published (OR-1A, OR-1B, OR-2, OR-3, OR-4, OR-7, OR-8A, OR-8B, OR-8C, OR-8D, OR-10A, OR-10C, OR-11, and OR-12) • Draft HCP submitted to Service by California State Parks for San Luis Obispo Coast District and the Oceano Dunes State Vehicular Recreation Area • New River Area of Critical Environmental Concern (ACEC) Management Plan published (OR-10A) • Clam and Moonstone Beach County Parks Draft Management Master Plan published (CA-3A and CA-3B) • Exclosures erected at CA-3B, CA-4A, and CA-27A • Construction of symbolic fencing at CA-4B • Predator control at OR-7, OR-8A, OR-8B, OR-8C, and OR-8D by Forest Service
Regulatory Milestones	
1972	• Plover identified as a species of concern in Oregon
1975	• Oregon Fish and Wildlife Commission administratively lists plover as threatened
1989	• Plover listed as threatened on Oregon Endangered Species list
1992	• Proposed Federal listing as threatened
1993	• Federally listed as threatened
1995	• Proposed critical habitat designation
1999	• Final critical habitat designation of 19,474 acres in 28 units
2002	• Petition to delist plover submitted by the Surf Ocean Beach Commission of Lopoc, California
2003	• Critical habitat designation remanded and four units vacated
2004	• Proposed critical habitat designation of 17,299 acres within 35 units • Notice published that delisting may be warranted for the plover
2005	• Designation of critical habitat anticipated

3.1 Summary of Plover Management Costs

96. This Section estimates the total costs of past and future plover management efforts including the development and implementation of various management plans, and the costs associated with section 7 consultation. Future species and habitat management activities discussed in this Section are as outlined in beach and agency management plans.[62] As a result, the future management impacts quantified in this analysis are the ongoing result of management decisions made in previous years. Exhibit 3-2 details the impact of past plover and habitat management activities and Exhibit 3-3 details the impact of expected future plover and habitat management activities by potential habitat area. The exhibits only include potential habitat areas that have incurred or are expected to incur impacts due to plover conservation efforts.

[62] No information is available on the extent of future management not described in management plans. The recreation section (Section 4) of this analysis assumes that, on publicly accessible lands, exclosures will be constructed to protect plover nests. The direct costs of erecting nest exclosures are estimated in this Section of the report if this activity is specified in existing management plans.

Exhibit 3-2

PAST IMPACTS TO MANAGEMENT ACTIVITIES BY POTENTIAL CRITICAL HABITAT UNIT (1993-2004)

POTENTIAL CRITICAL HABITAT UNITS	Past Impacts Unadjusted Impacts		Past Impacts Present Value 3%		Past Impacts Present Value 7%	
	Low	High	Low	High	Low	High
Proposed for designation						
WA 2. Damon Pt, Oyhut	$14,000	$54,000	$15,000	$57,000	$16,000	$62,000
WA 3. Midway Beach	$10,000	$39,000	$11,000	$42,000	$12,000	$45,000
WA 4. Leadbetter Pt	$25,000	$97,000	$26,000	$103,000	$28,000	$111,000
OR 3. Bayocean Spit	$0	$1,000	$0	$1,000	$0	$1,000
OR 7. Sutton/Baker Beaches	$230,000	$231,000	$272,000	$272,000	$340,000	$341,000
OR 8A. Siltcoos River Spit	$230,000	$231,000	$272,000	$272,000	$340,000	$341,000
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	$130,000	$131,000	$154,000	$154,000	$192,000	$193,000
OR 8D. Tenmile Creek Spit	$230,000	$231,000	$272,000	$272,000	$340,000	$341,000
OR 9. Coos Bay N Spit	$430,000	$473,000	$544,000	$591,000	$754,000	$804,000
OR 10A. Bandon to Floras Lake	$302,000	$330,000	$319,000	$350,000	$343,000	$376,000
CA 1. Lake Earl	$28,000	$45,000	$30,000	$48,000	$32,000	$52,000
CA 3A. Clam Beach/Little Riv	$27,000	$27,000	$29,000	$29,000	$32,000	$32,000
CA 4A. Humboldt Bay, S Spit	$110,000	$130,000	$116,000	$136,000	$124,000	$146,000
CA 4B. Eel Riv N Spit & Beach	$23,000	$23,000	$24,000	$24,000	$26,000	$26,000
CA 4D. Eel River Gravel Bars	$41,000	$137,000	$43,000	$146,000	$47,000	$158,000
CA 10. Half Moon Bay	$11,000	$11,000	$12,000	$12,000	$13,000	$13,000
CA 11C. Wilder Cr. Beach	$11,000	$11,000	$12,000	$12,000	$13,000	$13,000
CA 12A. Jetty Rd to Aptos	$219,000	$219,000	$236,000	$236,000	$260,000	$260,000
CA 12C. Monterey to Moss Lnd	$537,000	$554,000	$611,000	$629,000	$730,000	$750,000
CA 14. San Simeon Beach	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000
CA 15A. Villa Cr Beach	$119,000	$119,000	$128,000	$128,000	$141,000	$141,000
CA 15B. Atascadero Beach	$100,000	$100,000	$108,000	$108,000	$119,000	$119,000
CA 15C. Morro Bay Beach	$294,000	$294,000	$317,000	$317,000	$350,000	$350,000
CA 16. Pismo Beach/Nipomo	$4,628,000	$4,645,000	$5,323,000	$5,342,000	$6,473,000	$6,493,000
CA 17A. Vandenberg North	$98,000	$159,000	$105,000	$169,000	$113,000	$183,000
CA 18. Devereaux Beach	$196,000	$196,000	$214,000	$214,000	$240,000	$240,000
CA 19A. Mandalay to Santa Clara	$19,000	$28,000	$21,000	$30,000	$23,000	$33,000
CA 19C. Mugu Lagoon	$14,000	$23,000	$15,000	$24,000	$16,000	$26,000
CA 22A. Bolsa Chica Reserve	$14,000	$23,000	$15,000	$24,000	$16,000	$26,000
CA 24. San Onofre St Beach	$41,000	$59,000	$43,000	$62,000	$47,000	$67,000
CA 25A Batiquitos West	$5,000	$7,000	$5,000	$8,000	$5,000	$9,000
CA 26. Los Penasquitos	$5,000	$7,000	$5,000	$8,000	$5,000	$9,000
CA 27A. North Island N.	$14,000	$23,000	$15,000	$24,000	$16,000	$26,000
CA 27B. North Island S.	$4,000	$14,000	$4,000	$15,000	$4,000	$16,000
CA 27C. Silver Strand	$83,000	$102,000	$89,000	$109,000	$97,000	$120,000
CA 27D. Delta Beach	$4,000	$14,000	$4,000	$15,000	$4,000	$16,000
CA 27E. Sweetwater NWR	$21,000	$51,000	$23,000	$55,000	$25,000	$59,000

Exhibit 3-2

PAST IMPACTS TO MANAGEMENT ACTIVITIES BY POTENTIAL CRITICAL HABITAT UNIT (1993-2004)

POTENTIAL CRITICAL HABITAT UNITS	Past Impacts Unadjusted Impacts		Past Impacts Present Value 3%		Past Impacts Present Value 7%	
	Low	High	Low	High	Low	High
Proposed for designation						
CA 27F. Tijuana River Beach	$326,000	$329,000	$374,000	$377,000	$451,000	$454,000
ALL OREGON (HCP)	$1,202,000	$1,202,000	$1,406,000	$1,406,000	$1,744,000	$1,744,000
SUBTOTAL	**$9,795,603**	**$10,372,439**	**$11,211,228**	**$11,823,728**	**$13,535,130**	**$14,198,576**
Areas identified for possible inclusion						
WA 1. Copalis Spit	$6,000	$25,000	$7,000	$27,000	$7,000	$29,000
OR 1A. Columbia River Spit	$0	$1,000	$0	$1,000	$0	$1,000
OR 1B. Necanicum River Spit	$0	$1,000	$0	$1,000	$0	$1,000
OR 2. Nehalem River Spit	$0	$1,000	$0	$1,000	$0	$1,000
OR 4. Netarts Spit	$0	$1,000	$0	$1,000	$0	$1,000
OR 5A. Sand Lake North	$0	$1,000	$0	$1,000	$0	$1,000
OR 5B. Sand Lake South	$0	$1,000	$0	$1,000	$0	$1,000
OR 6. Nestucca River Spit	$0	$1,000	$0	$1,000	$0	$1,000
OR 8C. N Umpqua River Spit	$130,000	$131,000	$154,000	$154,000	$192,000	$193,000
OR 10B. Sixes River Spit	$0	$1,000	$0	$1,000	$0	$1,000
OR 10C. Elk River Spit	$0	$1,000	$0	$1,000	$0	$1,000
OR 11. Euchre Creek Spit	$0	$1,000	$0	$1,000	$0	$1,000
OR 12. Pistol River Spit	$0	$1,000	$0	$1,000	$0	$1,000
CA 11A. Waddell Cr Beach	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000
SUBTOTAL	**$141,000**	**$167,000**	**$166,000**	**$193,000**	**$205,000**	**$235,000**
Areas proposed for exclusion						
Salinas River National Wildlife Refuge	$739,000	$748,000	$858,000	$868,000	$1,054,000	$1,065,000
Guadalupe/Nipomo Dunes National Wildlife Refuge	$261,000	$271,000	$283,000	$293,000	$315,000	$326,000
SUBTOTAL	**$1,000,000**	**$1,019,000**	**$1,141,000**	**$1,161,000**	**$1,369,000**	**$1,391,000**

Exhibit 3-3

FUTURE IMPACTS TO MANAGEMENT ACTIVITIES BY POTENTIAL CRITICAL HABITAT UNIT (2005-2025)

POTENTIAL CRITICAL HABITAT UNITS	Future Impacts Constant Dollars		Future Impacts Present Value (3%)		Future Impacts Present Value (7%)	
	Low	High	Low	High	Low	High
Proposed for designation						
OR 3. Bayocean Spit	$431,000	$431,000	$296,000	$296,000	$187,000	$187,000
OR 7. Sutton/Baker Beaches	$413,000	$413,000	$312,000	$312,000	$228,000	$228,000
OR 8A. Siltcoos River Spit	$413,000	$413,000	$312,000	$312,000	$228,000	$228,000
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	$203,000	$203,000	$154,000	$154,000	$112,000	$112,000
OR 8D. Tenmile Creek Spit	$413,000	$413,000	$312,000	$312,000	$228,000	$228,000
OR 9. Coos Bay N Spit	$525,000	$525,000	$397,000	$397,000	$290,000	$290,000
OR 10A. Bandon to Floras Lake	$630,000	$672,000	$476,000	$508,000	$348,000	$371,000
CA 3A. Clam Beach/Little Riv	$158,000	$158,000	$119,000	$119,000	$87,000	$87,000
CA 4A. Humboldt Bay, S Spit	$893,000	$893,000	$675,000	$675,000	$493,000	$493,000
CA 4B. Eel Riv N Spit & Beach	$158,000	$158,000	$119,000	$119,000	$87,000	$87,000
CA 4D. Eel River Gravel Bars	$53,000	$284,000	$40,000	$215,000	$29,000	$157,000
CA 10. Half Moon Bay	$63,000	$63,000	$48,000	$48,000	$35,000	$35,000
CA 11C. Wilder Cr. Beach	$63,000	$63,000	$48,000	$48,000	$35,000	$35,000
CA 12A. Jetty Rd to Aptos	$1,276,000	$1,276,000	$965,000	$965,000	$704,000	$704,000
CA 12C. Monterey to Moss Lnd	$1,692,000	$1,692,000	$1,279,000	$1,279,000	$934,000	$934,000
CA 14. San Simeon Beach	$16,000	$16,000	$12,000	$12,000	$9,000	$9,000
CA 15A. Villa Cr Beach	$693,000	$693,000	$524,000	$524,000	$383,000	$383,000
CA 15B. Atascadero Beach	$583,000	$583,000	$441,000	$441,000	$322,000	$322,000
CA 15C. Morro Bay Beach	$1,717,000	$1,717,000	$1,298,000	$1,298,000	$948,000	$948,000
CA 16. Pismo Beach/Nipomo	$16,764,000	$16,772,000	$12,922,000	$12,930,000	$9,709,000	$9,718,000
CA 18. Devereaux Beach	$587,000	$8,267,000	$445,000	$6,254,000	$326,000	$4,570,000
CA 19A. Mandalay to Santa Clara	$32,000	$32,000	$24,000	$24,000	$17,000	$17,000
CA 19C. Mugu Lagoon	$14,000	$22,000	$14,000	$22,000	$14,000	$22,000
CA 24. San Onofre St Beach	$14,000	$22,000	$14,000	$22,000	$14,000	$22,000
CA 27C. Silver Strand	$378,000	$378,000	$286,000	$286,000	$209,000	$209,000
CA 27F. Tijuana River Beach	$929,000	$929,000	$703,000	$703,000	$513,000	$513,000
ALL OREGON (HCP)	$3,043,000	$3,643,000	$2,377,000	$2,823,000	$1,820,000	$2,138,000
SUBTOTAL	**$32,150,311**	**$40,728,742**	**$24,610,110**	**$31,097,372**	**$18,309,076**	**$23,047,701**
Areas identified for possible inclusion						
OR 1A. Columbia River Spit	$584,000	$584,000	$437,000	$437,000	$315,000	$315,000
OR 1B. Necanicum River Spit	$574,000	$574,000	$427,000	$427,000	$305,000	$305,000
OR 2. Nehalem River Spit	$574,000	$574,000	$427,000	$427,000	$305,000	$305,000
OR 4. Netarts Spit	$146,000	$146,000	$86,000	$86,000	$44,000	$44,000
OR 5B. Sand Lake South	$431,000	$431,000	$296,000	$296,000	$187,000	$187,000
OR 8C. N Umpqua River Spit	$492,000	$492,000	$337,000	$337,000	$216,000	$216,000

Exhibit 3-3

FUTURE IMPACTS TO MANAGEMENT ACTIVITIES BY POTENTIAL CRITICAL HABITAT UNIT (2005-2025)

POTENTIAL CRITICAL HABITAT UNITS	Future Impacts Constant Dollars		Future Impacts Present Value (3%)		Future Impacts Present Value (7%)	
	Low	**High**	**Low**	**High**	**Low**	**High**
OR 10C. Elk River Spit	$289,000	$289,000	$183,000	$183,000	$103,000	$103,000
OR 11. Euchre Creek Spit	$289,000	$289,000	$183,000	$183,000	$103,000	$103,000
OR 12. Pistol River Spit	$146,000	$146,000	$86,000	$86,000	$44,000	$44,000
CA 11A. Waddell Cr Beach	$16,000	$16,000	$12,000	$12,000	$9,000	$9,000
SUBTOTAL	**$3,538,000**	**$3,538,000**	**$2,476,000**	**$2,476,000**	**$1,631,000**	**$1,631,000**
Areas proposed for exclusion						
Salinas River National Wildlife Refuge	$3,587,000	$3,587,000	$2,712,000	$2,712,000	$1,980,000	$1,980,000
Guadalupe/Nipomo Dunes National Wildlife Refuge	$1,103,000	$1,103,000	$834,000	$834,000	$609,000	$609,000
SUBTOTAL	**$4,689,000**	**$4,689,000**	**$3,545,000**	**$3,545,000**	**$2,589,000**	**$2,589,000**

3.2 Habitat Management Activities

97. Exhibits 3-2 and 3-3 include costs of management activities borne by various public and private entities managing beaches across the potential critical habitat. Exhibit 3-4 presents the land manager and/or owner of each potential critical habitat area that is expected to bear the costs of plover and habitat management efforts. The remainder of this Section describes the specific management activities undertaken or expected to be undertaken by these entities. Details of the costs of these efforts per entity and geographic region is provided in Appendix C of this analysis.

Exhibit 3-4

PUBLIC LAND MANAGERS AND/OR OWNERS WITHIN POTENTIAL PLOVER CRITICAL HABITAT

Potential Critical Habitat Unit	Land Manager
Units Proposed	
WA 2. Damon Pt, Oyhut	Washington State Parks; Washington Department of Natural Resources
WA 3. Midway Beach	Washington State Parks
WA 4. Leadbetter Pt	Washington State Parks
OR 3. Bayocean Spit	Army Corps of Engineers
OR 7. Sutton/Baker Beaches	Forest Service
OR 8A. Siltcoos River Spit	Forest Service
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	Forest Service
OR 8D. Tenmile Creek Spit	Forest Service
OR 9. Coos Bay N Spit	Bureau of Land Management; Army Corps of Engineers
OR 10A. Bandon to Floras Lake	Oregon Parks and Recreation Department
CA 1. Lake Earl	California State Parks
CA 2. Big Lagoon	California State Parks
CA 3A. Clam Beach/Little Riv	California State Parks; Humboldt County
CA 3B. Mad River	Humboldt County
CA 4A. Humboldt Bay, S Spit	California Department of Fish and Game; Bureau of Land Management
CA 4B. Eel Riv N Spit & Beach	California Department of Fish and Game
CA 4C. Eel Riv S Spit & Beach	Private
CA 4D. Eel River Gravel Bars	Private
CA 5. MacKerricher Beach	California State Parks
CA 6. Manchester Beach	California State Parks
CA 7. Dillon Beach	Private
CA 8. Pt Reyes Beach	National Park Service
CA 9. Limantour Spit	National Park Service
CA 10. Half Moon Bay	California State Parks
CA 11B. Scott Cr. Beach	Private
CA 11C. Wilder Cr. Beach	California State Parks
CA 12A. Jetty Rd to Aptos	California State Parks
CA 12B. Elkhorn Sl Mudflat	California Department of Fish and Game
CA 12C. Monterey to Moss Lnd	California State Parks; Service
CA 13. Pt Sur Beach	California State Parks
CA 14. San Simeon Beach	California State Parks
CA 15A. Villa Cr Beach	California State Parks
CA 15B. Atascadero Beach	California State Parks
CA 15C. Morro Bay Beach	California State Parks
CA 16. Pismo Beach/Nipomo	California State Parks; The Nature Conservancy
CA 17A. Vandenberg North	Department of Defense
CA 17B. Vandenberg South	Department of Defense
CA 18. Devereaux Beach	University of California Los Angeles
CA 19A. Mandalay to Santa Clara	California State Parks
CA 19B. Ormond Beach	Private
CA 19C. Mugu Lagoon	Private
CA 19D. Mugu Lagoon S.	California State Parks

Exhibit 3-4

PUBLIC LAND MANAGERS AND/OR OWNERS WITHIN POTENTIAL PLOVER CRITICAL HABITAT

Potential Critical Habitat Unit	Land Manager
CA 20. Zuma Beach	Los Angeles County
CA 21A. Santa Monica Beach	Los Angeles County
CA 21B. Dockweiler N	Los Angeles County
CA 21C. Dockweiler S	Los Angeles County
CA 21D. Hermosa Beach	City of Hermosa
CA 22A. Bolsa Chica Reserve	California Department of Fish and Game
CA 22B. Huntington St. Beach	California State Parks
CA 23. Santa Ana River Mouth	California State Parks
CA 24. San Onofre St Beach	California State Parks
CA 25A Batiquitos West	California Department of Fish and Game; California State Parks
CA 25B. Batiquitos Middle	California Department of Fish and Game
CA 25C. Batiquitos East	Private
CA 26. Los Penasquitos	California State Parks
CA 27A. North Island N.	Private
CA 27B. North Island S.	Private
CA 27C. Silver Strand	California State Parks
CA 27D. Delta Beach	Private
CA 27E. Sweetwater NWR	Service
CA 27F. Tijuana River Beach	California State Parks; Service
Areas identified for possible inclusion	
WA 1. Copalis Spit	Washington State Parks
OR 1A. Columbia River Spit	Oregon Parks and Recreation Department
OR 1B. Necanicum River Spit	Oregon Parks and Recreation Department
OR 2. Nehalem River Spit	Oregon Parks and Recreation Department
OR 4. Netarts Spit	Oregon Parks and Recreation Department
OR 5A. Sand Lake North	Tillamook County
OR 5B. Sand Lake South	Private
OR 6. Nestucca River Spit	Oregon Parks and Recreation Department
OR 8C. N Umpqua River Spit	Forest Service
OR 10B. Sixes River Spit	Oregon Parks and Recreation Department
OR 10C. Elk River Spit	Private
OR 11. Euchre Creek Spit	Private
OR 12. Pistol River Spit	Oregon Parks and Recreation Department
CA 11A. Waddell Cr Beach	California State Parks
Areas proposed for exclusion	
Salinas River National Wildlife Refuge	Service
Guadalupe/Nipomo Dunes National Wildlife Refuge	Service
San Diego	Private
Marine Corps Base Camp Pendleton	Department of Defense
Naval Amphibious Base, Coronado	Department of Defense
San Francisco Bay	Service
Source: GIS analysis performed by IEc based on management plans and conversations with land managers.	

3.2.1 California

98. State, Federal, and local governments, as well as other landowners, manage plover habitat in California for the benefit of the species.

California State Parks

99. California State Parks manages beaches with nesting and wintering populations of the plover. In 1990 the agency and the Service began constructing nest exclosures at Monterey Bay and Pismo/Oceano beaches. Management for the plover was primarily restricted to these two areas until about 2001 when California State Parks drafted Statewide management guidelines for the plover.[63] California State Parks relies on the Service's Draft Recovery Plan for the plover to effectively target plover protection to beaches most likely to provide quality habitat for the bird. Efforts outside of Monterey and Pismo/Oceano Dunes began in 2001 at Little River State Beach (CA-3A), Manchester State Park (CA-6), Half Moon Bay State Beach (CA-10), Big Basin Redwoods State Park (CA-11A), Wilder Ranch State Park (CA-11C), Sunset State Beach (CA-12A), Zmudowski State Beach (CA-12A), Salinas River State Beach (CA-12C), Marina State Beach (CA-12C), San Simeon State Park (CA-14), Estero Bay (CA-15A), Morro Strand State Beach (CA-15B), Montana de Oro State Park (CA-15B), McGrath State Beach (CA-19A), Silver Strand State Beach (CA-27C), and Border Field State Park (CA-27F).[64] Management efforts include construction of nest exclosures and symbolic fencing, dog prohibitions, and predator control. Other management efforts likely to benefit the plover and habitat include control of invasive species (e.g., European beach grass).[65] Costs of management efforts at California State Beaches is based on an estimated cost per breeding pair of plover. According to California State Parks, past costs of these management efforts were approximately $675 per nest (or per breeding pair). Future management costs per nest are expected to be increase to $750 per nest.[66] The past and future costs of management efforts in each of these 14 potential critical habitat units (as described in Appendix C) is based on these per-nest estimates and the number of breeding pair per site.

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[63] Natural Resources Division of the California Department of Parks and Recreation, *Western Snowy Plover Systemwide Management Guidelines*, March 2002.

[64] California State Parks, *2002 and 2003 Western Snowy Plover Nesting Summary*, January 23, 2004.

[65] Personal communication with California State Parks, May 5, 2005.

[66] Annual costs are estimated based on the average cost to protect a plover nest at Oceano Dunes State Vehicular Recreation Area prior to 2001 (i.e., prior to California State Parks settlement of a lawsuit with Sierra Club that greatly increased plover management costs). The average cost to protect 35 plover nests was found to be approximately $5,700 per nest. The number of plover nests in 2002 are estimated by California State Parks. California State Parks, 2002 and 2003 Western Snowy Plover Nesting Summary, January 23, 2004.

100. In April 2004, the California State Parks drafted a HCP for Estero Bluffs (CA-15A), Morro Strand State Beach (CA-15B), Montana de Oro State Park (CA-15C), Pismo Dunes Natural Preserve (CA-16), and Oceano Dunes State Vehicular Recreation Area (CA-16).[67] The HCP covers multiple species; however, plover is the main driver for developing the plan.[68] Plover conservation measures recommended in the HCP include: constructing exclosures; erecting symbolic fencing; posting signage; creating and enforcing speed limits; education; ensuring compliance of other concessions, supporting agencies, and organizations in efforts; implementing maintenance project protective measures; protecting chicks and eggs outside of fenced areas; conducting predator management; and non-breeding season protection. The total cost of developing the HCP is likely to be $1 million.[69] From 1993 to 2000 California State Parks spent approximately $200,000 annually on plover management primarily at Pismo Dunes Natural Preserve and Oceano Dunes State Vehicular Recreation Area (Unit 16). Costs increased from 2001 to 2004 averaging $750,000 a year. Future annual management costs in this potential critical habitat unit are expected to continue at a rate of approximately $750,000 per year in constant dollar terms.[70] As detailed in Appendix C, costs of management efforts in Unit CA-16 are calculated according to these annual cost estimates provided by California State Parks, including an additional $1 million in 2005 for development of the ongoing draft HCP.

California Department of Fish and Game

101. The California Department of Fish and Game manages the Eel River Wildlife Area (CA-4A and CA-4B), Moss Landing Wildlife Area (CA-12C), Bolsa Chica Ecological Reserve (CA-22A), and Batiquitos Lagoon Ecological Reserve (CA-25A and CA-25B). A management plan has been drafted for the Moss Landing Wildlife Area, and is discussed below.

102. Nest exclosures have been constructed and monitoring undertaken for the plover at the Eel River Wildlife Area (CA-4A and CA-4B) since 2002. Monitoring of nests is expected to continue from 2005 through 2025. According to the California Department of Fish and Game, the costs of exclosure maintenance and monitoring is approximately $15,000 per year in constant dollar terms (or $7,500 each in Units CA-4A and CA-4B). Appendix C of this analysis quantifies the present value of the past and future impacts of these monitoring efforts.[71]

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[67] California State Parks. Second Administrative Draft Habitat Conservation Plan for The California Department of Parks and Recreation San Luis Obispo Coast District and Oceano Dunes State Vehicular Recreation Area. Prepared by Thomas Reid Associates in association with California Sate University, Monterey Bay. April 12, 2004.

[68] Personal communication with Andrew Zilkey, District Superintendent, California State Parks, March 7, 2005.

[69] Personal communication with Andrew Zilkey, District Superintendent, California State Parks, January 3, 2005.

[70] Personal communication with Andrew Zilkey, District Superintendent, California State Parks, March 7, 2005.

[71] Personal communication with Ron Jurek, California Department of Fish and Game, December 3, 2004.

103. In October 2003, California Department of Fish and Game drafted a management plan for the salt ponds in Moss Landing Wildlife Area (CA-12C).[72] The management plan covers multiple species, including plover, brown pelicans, and other water birds. The plover, however, was the focus of the plan and the primary reason for its development. Plover conservation efforts outlined in the management plan include: monitoring, predator management, fencing, signage, and management of non-native vegetation. In addition, the plan outlines a water management scheme designed to ensure that plovers have dry substrate for nesting and wet areas for feeding. The majority of the salt ponds covered in this management plan are closed to public access to limit human disturbance. The California Department of Fish and Game spends approximately $33,000 per year (beginning in 1995 and expected through 2025) in constant dollar terms on these plover conservation efforts. The present value of this annual cost, plus the estimated $10,000 incurred in 2003 for the development of the salt pond management plan, are included in Appendix C of this analysis.[73]

104. A habitat restoration project is currently underway at the Bolsa Chica Ecological Reserve (CA-22A). The Bolsa Chica Ecological Reserve is adjacent to an oil field that will be converted to habitat; plover is a focus species of this restoration project. The details of this project, and expected impacts are uncertain at this stage.

Bureau of Land Management

105. BLM's Arcata Field Office manages a portion of Humboldt Bay South Spit (CA-4A). BLM began managing this area for the plover in 2003, including: construction of a 300 by 600 foot symbolic fence; beach grass removal; chick banding; leash requirements for dogs; seasonal driving restrictions; and law enforcement.[74] In addition, BLM is conducting a 20-acre habitat restoration project for the plover. BLM estimates that plover and habitat conservation efforts at Humboldt Bay South Spit have been approximately $35,000 per year in constant dollar terms, and are expected to continue at a similar level through 2025.[75] This impact is captured in Appendix C.

U.S. Fish & Wildlife Service

106. The Service manages the Sweetwater Marsh National Wildlife Refuge (CA-27E), Tijuana Slough National Wildlife Refuge (CA-27F), Salinas River National Wildlife Refuge (proposed for exclusion), and Guadalupe-Nipomo Dunes National Wildlife Refuge (proposed for exclusion). Each of these wildlife refuges has at least a draft management plan describing plover conservation initiatives.

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[72] Eyster, Charleton, Doug George, and Gary Page, *Management Plan for the Salt Ponds in the California Department of Fish and Game Moss Landing Wildlife Area, Monterey County, CA*, prepared by the PRBO Conservation Science, 2003.

[73] Cost estimates were provided by Gary Page, PRBO Conservation Science, through personal communication on January 27, 2005.

[74] Access driving is permitted at this location. Pleasure driving is not permitted at any time.

[75] Personal communication with Amy Krause, Bureau of Land Management, March 30, 2005.

107. The Tijuana Slough National Wildlife Refuge (CA-27F) is also part of the Tijuana River National Estuarine Research Reserve. The Draft Comprehensive Management Plan for the Tijuana River Slough was published in 1999.[76] Plover management efforts include on-site monitoring, which began in 1996, is expected to continue through 2025, and costs the Service an estimated $30,000 per year in constant dollar terms, as included in Appendix C.

108. In 2002, the Service drafted a conservation plan for the Salinas River National Wildlife Refuge (proposed for exclusion).[77] Although the conservation plan covers many species, one key objective is to enhance the plover population within the refuge. In the mid-1990s, the refuge started protecting the plover by managing non-native vegetation, posting signs, and installing symbolic fencing. An estimated 36 acres is closed to human traffic, identified either by symbolic fencing or signage.[78] In addition, the Refuge conducts monitoring, predator management, and enforcement activities. The Refuge also provides limited wildlife oriented recreational activities. Appendix C of this analysis includes past and future costs of monitoring, predator management, fencing, and management plan development.

109. In January 2000, the Service drafted an environmental assessment for the Proposed Guadalupe-Nipomo Dunes National Wildlife Refuge. Prior to 2000, the land was owned by The Nature Conservancy, which did not actively manage the area.[79] The Refuge was formally established in August 2000 to protect breeding habitat for several species, including the plover. The current management activities include monitoring, seasonal fencing along a 2.5-mile stretch of coastline, and a volunteer docent program. Visitors to the Refuge are able to engage in recreational activities such as hiking, wildlife viewing, and surf fishing. The Refuge receives approximately 14,000 visitors per year.[80] Appendix C of this analysis includes costs of the environmental assessment in 2001, and subsequent annual costs of monitoring, fencing, and maintaining the volunteer program, totaling approximately $53,000 per year in constant dollar terms.

110. The Sweetwater Marsh National Wildlife Refuge (CA-27E) currently operates without an official management plan; however the Service is currently working on developing a comprehensive conservation plan.[81] This plan will provide management guidance for the Refuge for the next 15 years. Current plover management efforts

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[76] California Department of Parks and Recreation, U.S. Fish and Wildlife Service, and National Oceanic and Atmospheric Administration, *Comprehensive Management Plan for Tijuana River National Estuarine Research Reserve and Tijuana Slough National Wildlife Refuge*, prepared by CONCUR, Inc., March 1999.

[77] U.S. Fish and Wildlife Service, *Salinas River National Wildlife Refuge Comprehensive Conservation Plan*, 2002.

[78] Personal Communication with Diane Katama, Salinas River National Wildlife Refuge, February 11, 2005.

[79] U.S. Fish and Wildlife Service, *Conceptual Management Plan, Proposed Guadalupe-Nipomo National Wildlife Refuge, San Luis Obispo and Santa Barbara Counties, California*, 2000.

[80] Personal Communication with Chris Barr, Guadalupe-Nipomo Dunes National Wildlife Refuge, February 9, 2005.

[81] Alternatives for the Sweetwater National Wildlife Refuge Comprehensive Conservation Plan. Accessed at http://www.fws.gov/pacific/sandiegorefuges/new/ccp/CCP%203%20Sweetwater%20Marsh.htm, on April 4, 2005.

include annual site preparation and monitoring. Habitat enhancement is proposed in the draft comprehensive conservation plan. Because the habitat enhancement project is still in the proposal phase, specific implementation methods and resulting impacts are uncertain.

Counties and Municipalities and Other Local Landowners

111. Counties, municipalities, and other local landowners have undertaken plover management. The management actions undertaken by these entities are described below.

112. The University of California drafted a Snowy Plover Management Plan (SPMP) in 2001 for Coal Oil Point Reserve (CA 18) at the suggestion of the Service.[82] Dedicated to plover protection measures, the management plan commits the Reserve to monitoring and enforcing restrictions to human activities through habitat fencing. The Reserve conducts educational outreach and has a docent program staffed by students from University of California, Santa Barbara. In the future, the Reserve plans to increase enforcement of restrictions and conduct predator management activities. These efforts, however, are contingent on funding. Recreational activities permitted in the Reserve include jogging, walking, and surfing. No decrease in recreational use has been observed since the 1999 designation of critical habitat, and none is anticipated in the future.[83] Appendix C describes estimated costs of past and future plover management activities at the Reserve from 1999, when active management began, and through 2025.

113. In 1991, California initiated the Natural Community Conservation Program (NCCP), which aims at conserving natural communities at an ecosystem scale. The initial focus of the program was coastal sage scrub habitat of the California gnatcatcher. Under this program southwestern San Diego County prepared a Multiple Species Conservation Program (MSCP). The MSCP is intended to preserve a network of habitat an open space, protect biodiversity, and enhance the region's quality of life.[84] The plan identifies priority areas for conservation and other areas for future development, streamlining existing permit procedures for development projects that impact habitat.[85] The City of San Diego Subarea Plan establishes the City's Multi-Habitat Planning Area (MHPA), delineating geographic areas targeted for conservation.[86] The MHPA covers over 80 species, including 28 federally-listed or candidate species, including the plover. The MHPA identifies areas including or near potential critical habitat areas (CA-26, CA-27D, CA-27E, and CA-27F). Protective measures specific to the plover are not identified in the plan.

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[82] Coal Oil Point Reserve, University of California, *Snowy Plover Management Plan*, 2001. This information is available at http://coaloilpoint.ucnrs.org/subpage1/TechDocs/ManagePlan.pdf.

[83] Personal Communication with Cristina Sandoval, Coal Oil Point Reserve, February 21, 2005.

[84] The Multiple Species Conservation Program is available at http://www.sandiego.gov/mscp/plansum.shtml.

[85] Ibid.

[86] The City of San Diego Subarea Plan is available at http://www.sandiego.gov/mscp/pdf/subarea.pdf.

3.2.2 Oregon

114. State and Federal entities undertake plover management in Oregon. Plover management efforts are discussed by land manager in this Section.

Oregon Parks and Recreation Department

115. Oregon Parks and Recreation Department (OPRD) owns most of the Oregon shore and is in the process of developing a HCP for these areas.

116. In December 2004, the OPRD drafted a HCP for most of the wet sand area in the State of Oregon.[87] The HCP identifies how OPRD will minimize and mitigate impact to the plover in 15 plover management areas encompassing 48 of the 365 miles of the Oregon coast. These management areas include 15 potential critical habitat areas (OR-1A, OR-1B, OR-2, OR-3, OR-4, OR-5B, OR-7, OR-8A, OR-8B, OR-8C, OR-8D, OR-10A, OR-10C, OR-11, and OR-12). For those five plover management areas that are currently occupied (OR-7, OR-8A, OR-8B, OR-8D, OR-10A) management activities will include habitat restoration, predator management, monitoring, seasonal dry sand restrictions, and public outreach.

117. Site management plans will also be developed for the remaining ten plover management areas not currently occupied. Once site management plans are completed, active management similar to the occupied areas will begin. Active management in these areas will include predator management, educational programs, monitoring, symbolic fencing, a beach access modification in OR-1A, driving prohibitions, and compliance monitoring. Active management is expected to begin in OR-1A, OR-1B, and OR-2 in 2006. Active management is expected to begin in 2011 in Units OR-3 and OR-5B, in 2016 at OR-8C, OR-10C, and OR-11, and in 2021 for OR-12 and OR-4.[88] In constant dollar terms, the predator management is anticipated to cost $4,000 per year, monitoring $20,000 per year, compliance monitoring $3,000 per year, and symbolic fencing $5,000 in the first year and $1,500 every year thereafter. In addition, the beach access point modification in OR-1A is estimated to cost $10,000 in year 2006. The present value and annualized estimates of these impacts are presented in Appendix C of this report.

118. For the remaining plover beaches in Oregon, ORPD will continue to implement plover conservation efforts (i.e., nest exclosures and a 50-meter buffer). The impact on beach recreation of these restrictions is discussed in Section 4 of this analysis. Thus far OPRD has spent approximately $304,000 developing the HCP in 2005. ORPD has also incurred monitoring costs in the period 1993 to 2004 and anticipated continuing these monitoring efforts through 2025. Specific annual estimates of plover monitoring by ORPD are described in Appendix C.

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[87] Oregon Parks and Recreation Department, *Habitat Conservation Plan for the Western Snowy Plover*, 2004.

[88] Personal communication with Service biologist, June 15, 2005.

Bureau of Land Management

119. The Coos Bay District of the BLM manages the Coos Bay North Spit (OR-9) and New River Area of Critical Environmental Concern (ACEC) (OR-10A). Management plans have been finalized for both of these areas.

120. The Coos Bay Shorelands Final Management Plan was published in 1995 (OR-9).[89] Outlined plover protection efforts include closing the dry sand to vehicle access during the nesting season on the southern five miles of the 10-mile area; prohibiting pack-in camping on the dry sand in this same area; conducting beach grass removal; and monitoring. Recreational uses of the Coos Bay Shorelands include OHV driving, wildlife viewing, horseback riding, hunting, mushroom collecting, berry picking, day hiking, clamming, and crabbing. Appendix C of this analysis details impacts of predator control and habitat restoration, which have varied by year.[90] Costs of monitoring efforts are included in the quantified impacts of the Oregon Statewide HCP as described above.

121. BLM updated the New River Area of Critical Environmental Concern Management Plan in 2004 (OR-10A).[91] Plover management activities include restoring habitat on the foredune; restricting public vehicular access to the boat launch at Storm Ranch during the nesting season; implementing dry-sand restrictions during the nesting season at Floras Lake and the foredune west of New River; and requiring dogs to be leashed in breeding areas. Recreation is comprised mainly of sightseeing along the roadway (52 percent) and hiking (34 percent). Other recreational activities include fishing, hunting, bicycling, horseback riding, canoeing, and kayaking. Since 1993, the BLM has undertaken plover conservation efforts, including monitoring, predator control, and habitat restoration.[92] Appendix C of this analysis details impacts of predator control and habitat restoration, which have varied by year. Costs of monitoring efforts are included in the quantified impacts of the Oregon Statewide HCP as described above.

Forest Service

122. Siuslaw National Forest (OR-7) and Oregon Dunes National Recreation Area (OR-8A, OR-8B, OR-8C, and OR-8D) are managed by the Forest Service.

123. At Siuslaw National Forest, and at Oregon Dunes National Recreation Area Units OR-8A and OR-8D, the Forest Service conducted annual predator control activities, fencing, and habitat restoration, all for the benefit of the plover. These activities cost approximately $7,000, $10,000, and $6,000 respectively per unit in constant dollar terms. These activities are anticipated to continue through 2025, although the Forest Service

[89] Bureau of Land Management, Coos Bay District Office, *Coos Bay Shorelands Final Management Plan*, 1995.

[90] Personal communication with Kerrie Palermo, Bureau of Land Management, December 7, 2004.

[91] Bureau of Land Management, Coos Bay District, *New River Area of Environmental Concern Management Plan Updated May 2004*, 2004.

[92] Personal communication with Kerrie Palermo, Bureau of Land Management, December 7, 2004.

expects to conduct predator control activities only every other year.[93] The present value of these efforts is described in Appendix C.

124. At Oregon Dunes National Recreation Area Units OR-8B and OR-8C, the Forest Service conducted annual predator control activities and habitat restoration for the benefit of the plover. These activities cost approximately $7,000 and $6,000 respectively per unit in constant dollar terms. These activities are anticipated to continue through 2025, although the Forest Service expects to conduct predator control activities only every other year. The present value of these efforts is described in Appendix C.

3.2.3 Washington

125. The Washington Department of Parks and Recreation manages Griffith Priday State Park (WA-1), Damon Point State Park (WA-2), South Beach State Park (WA-3), and Leadbetter Point State Park (WA-4). Although Griffith Priday State Parks is a historic plover site, the bird has not been observed at the site since the 1960.[94] Therefore, no plover conservation efforts have occurred at this site. Damon Point (WA-2) is owned by the Washington Department of Natural Resources and cooperatively managed with the Washington Department of Parks and Recreation. Plovers, however, nest on private property at this potential critical habitat area and no protection efforts are undertaken. At Midway Beach and Leadbetter Point State Park, plover protection efforts include monitoring, posting signs, enforcement of beach driving rules, and education.[95] The method of implementation and level of effort for these activities, however, is uncertain.

3.3 Administrative Costs

126. This section presents expected total administrative costs of consultations undertaken in accordance with section 7 of the Act within the potential critical habitat for the plover. First, this section defines the types of administrative costs likely to be associated with the proposed habitat. Next, the analysis presents estimated past and future administrative costs of consultation efforts.

3.3.1 Categories of Administrative Costs

127. The following section provides an overview of the categories of administrative costs impacts that arise due to the implementation of section 7 for the plover.

[93] Personal communication with Carl Frounfelker, Siuslaw National Forest, U.S. Forest Service, December 6, 2004.

[94] Personal communication with Lisa Lantz, Washington State Parks and Recreation, January 5, 2005.

[95] At Midway Beach (WA-3) the plovers nest on private land.

Technical Assistance

128. The Service responds to requests for technical assistance from State agencies, local municipalities, and private landowners and developers who may have questions regarding whether specific activities affect critical habitat. Technical assistance costs represent the estimated economic costs of informational conversations between these entities and the Service regarding the designation of critical habitat for the plover. Most likely, such conversations will occur between municipal or private property owners and the Service regarding lands designated as critical habitat or lands adjacent to critical habitat. The Service's technical assistance activities are voluntary and may occur with Federal, State, or local agencies, or private stakeholders.

Section 7 Consultations

129. Section 7(a)(2) of the Act requires Federal agencies (Action 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. Forest Service. More often, they will also include a third party involved in projects on non-Federal lands with a Federal nexus, such as State agencies and private landowners.

130. During a consultation, the Service, the Action agency, and the landowner manager 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.

131. Section 7 consultations with the Service may be either informal or formal. *Informal consultation*s 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, is designed to identify and resolve potential concerns at an early stage in the planning process. By contrast, a *formal consultation* is required if the Action agency determines that its proposed action may or will adversely affect the listed species or designated critical habitat in ways that cannot be resolved through informal consultation. 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 substantial administrative effort on the part of all participants.

3.3.2 Estimated Costs of Consultations and Technical Assistance

132. Estimates of the cost of an individual consultation and technical assistance request were developed from a review and analysis of historical section 7 files from a number of Service field offices around the country conducted in 2002. These files addressed consultations conducted for both listings and critical habitat designations. Cost figures were based on an average level of effort of low, medium, or high complexity, multiplied by the appropriate labor rates for staff from the Service and other Federal agencies.

133. The administrative cost estimates presented in this Section take into consideration the level of effort of the Service, the Action agency, and the applicant, as well as the varying complexity of the consultation or the technical assistance request. Costs associated with these consultations include the administrative costs associated with conducting the consultation, such as the cost of time spent in meetings, preparing letters, and the development of a biological opinion. Exhibit 3-5 summarizes the estimated administrative costs of consultations and technical assistance requests.

Exhibit 3-5

ESTIMATED ADMINISTRATIVE COSTS OF CONSULTATION AND TECHNICAL ASSISTANCE EFFORTS (PER EFFORT)[a]

Consultation Type	Service	Action Agency	Third Party	Biological Assessment
Technical Assistance	$260 - $680	N/A	$600 - $1,500	N/A
Informal Consultation	$1,000 - $3,100	$1,300 - $3,900	$1,200 - $2,900	$0 - $4,000
Formal Consultation	$3,100 - $6,100	$3,900 - $6,500	$2,900 - $4,100	$4,000 - $5,600
Programmatic Consultation	$11,500 - $16,100	$9,200 - $13,800	$0	$5,600

Sources: IEc analysis based on data from the Federal Government General Schedule Rates, Office of Personnel Management, 2002, a review of consultation records from several Service field offices across the country. Confirmed by local Action agencies.
Note: Low and high estimates primarily reflect variations in staff wages and time involvement by staff.

134. Since the listing of the plover in 1993, there have been four to five programmatic, approximately 30 formal, 24 informal, and 11 technical assistance efforts related to potential critical habitat. Where information is available on future consultation efforts, the administrative costs of these efforts is included in this analysis. Potential future consultations include: two to eight programmatic consultations regarding gravel mining in potential Unit CA-4D; one formal consultation regarding recreation activities at Pismo Beach (CA-16); one informal consultation at Devereaux Beach (CA-18); one formal consultation on military activities at Mugu Lagoon (CA-19C); and one formal consultation at San Onofre Beach (CA-24). Applying the per effort cost estimates in Exhibit 3-5, Appendix C of this analysis calculates the present value of these past and future consultation efforts for the plover.

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POTENTIAL ECONOMIC IMPACTS TO RECREATION ACTIVITIES SECTION 4

135. This section provides an analysis of economic impacts associated with plover conservation efforts related to restrictions on beach recreation activities. These activities include pedestrian access, equestrian access, driving on the beach (including street legal vehicles, off-highway vehicles (OHVs), and all-terrain vehicles (ATVs) depending on the area), and activities facilitated by vehicle use such as fishing and surfing. Specifically, this section estimates welfare losses to beach visitors who may visit the beach less often or may have a diminished beach experience as a result of plover conservation. The costs associated with beach management for recreation activities are discussed in Section 3 of the report; all other recreation-related impacts are discussed in this Section.

136. This Section is divided into seven parts. The first part summarizes the impact of plover restrictions on areas proposed for critical habitat designation (CHD), identified for possible inclusion, and proposed for exclusion (collectively referred to as potential critical habitat). Next, this Section describes the threats to the plover posed by recreation, and the location and types of activities likely to be affected by plover conservation efforts. Then, two separate methodologies used to estimate losses associated with plover conservation efforts are described. The fourth part estimates the economic impact of plover conservation efforts if a portion of visitors forego trips to the beach. The fifth part estimates the economic impact if plover conservation efforts are treated as a disamenity experienced by all visitors to beaches containing potential critical habitat. The sixth part estimates the economic impact to the surrounding communities if beach trips are lost. Finally, the Section ends with a discussion of the caveats to the analysis.

4.1 Summary of Findings

137. This analysis measures the impact of plover management activities on recreational beach users. Conservation efforts resulting in access or activity restrictions may reduce the quantity and quality of recreation for pedestrians, equestrians, and/or visitors using motor vehicles. In addition, less frequent mechanized beach-cleaning at beaches in southern California may diminish enjoyment of these sites. This Section discusses the value of beach recreation that might be lost as a result of plover management activities.

138. The analysis use two separate approaches to estimate losses. First, it assumes that as a result of fencing and closures, fewer people make trips to the beach, and it estimates the value of these lost trips (i.e., “Method 1”). This approach is applied to people who

recreate on foot, on horseback, or with motorized vehicles. Then, an alternative approach is taken, which assumes that no beach trips are lost. Instead, it assumes that beach users have a diminished (i.e., lower-quality) experience. This second approach (i.e., "Method 2") is used to estimate losses associated with mechanized beach raking and provides an alternative loss estimate for pedestrians and equestrians in areas where fencing or closures are likely.

139. Exhibit 4-1 summarizes the findings for the critical habitat units most likely to be affected. The analysis suggests that economic losses in the period from 1993 through 2004 have been between $27.8 million and $242.0 million in current (undiscounted) terms. Applying discount rates of three and seven percent results in a higher range of estimates. Anticipated futures costs for the period from 2005 to 2025 in units proposed for designation are on the order of $467.9 million to $1,158.2 million in constant dollars; applying a discount rate of seven percent suggests that losses may be as low as $246.0 million. Annualized impacts are presented by unit in Appendix D.

Exhibit 4-1

TOTAL RECREATIONAL LOSSES ESTIMATED BY UNITS IN POTENTIAL CRITICAL HABITAT FOR THE PLOVER

	Past Losses						Future Losses					
	Constant Dollars		Present Value (3%)		Present Value (7%)		Constant Dollars		Present Value (3%)		Present Value (7%)	
Unit	**Method 2**	**Method 1**	**Method 2**	**Method 1**	**Method 2**	**Method 1**	**Method 2**	**Method 1**	**Method 2**	**Method 1**	**Method 2**	**Method 1**
Proposed for designation												
OR 3. Bayocean Spit	$0	$0	$0	$0	$0	$0	$2,141,308	$0	$1,467,303	$0	$923,114	$0
OR 8D. Tenmile Creek Spit	$132,627	$53,569	$156,474	$63,200	$195,701	$79,044	$293,617	$118,593	$221,184	$89,337	$160,786	$64,942
OR 9. Coos Bay N Spit	$498	$498	$553	$553	$635	$635	$1,826	$1,826	$1,375	$1,375	$1,000	$1,000
OR 10A. Bandon to Floras Lake	$439,004	$43,497	$502,345	$49,772	$601,698	$59,616	$1,216,851	$126,057	$916,665	$94,960	$666,353	$69,029
CA 3A. Clam Beach/Little Riv	$17,050	$12,597	$18,304	$13,497	$20,075	$14,766	$91,320	$739,627	$67,582	$547,369	$48,050	$389,171
CA 3B. Mad River	$2,717	$2,717	$2,840	$2,840	$3,008	$3,008	$36,077	$36,077	$26,699	$26,699	$18,983	$18,983
CA 4A. Humboldt Bay, S Spit	$98	$314	$102	$324	$106	$337	$2,123	$7,804	$1,571	$5,775	$1,117	$4,106
CA 12A. Jetty Rd to Aptos	$4,708,836	$11,538,682	$5,001,937	$12,256,905	$5,411,198	$13,259,771	$37,118,158	$90,955,514	$27,469,704	$67,312,635	$19,530,537	$47,858,247
CA 12C. Monterey to Moss Lnd	$0	$162,179,438	$0	$196,164,843	$0	$254,550,469	$150,608,164	$395,848,249	$111,459,239	$292,951,880	$79,245,803	$208,284,276
CA 15B. Atascadero Beach	$825,148	$4,749,036	$870,250	$5,008,611	$932,879	$5,369,064	$10,260,741	$59,054,393	$7,593,575	$43,703,858	$5,398,915	$31,072,770
CA 15C. Morro Bay Beach	$8,175,982	$15,847,817	$8,675,121	$16,815,318	$9,371,637	$18,165,401	$71,219,194	$138,046,875	$52,706,553	$102,163,119	$37,473,548	$72,636,404
CA 16. Pismo Beach/Nipomo	$10,494,921	$17,524,244	$11,251,086	$18,581,334	$12,326,531	$20,065,724	$85,094,197	$189,275,225	$62,974,903	$140,075,226	$44,774,186	$99,591,329
CA 17A. Vandenberg North	$202,889	$8,625,070	$219,745	$9,341,645	$244,156	$8,578,724	$1,244,780	$52,917,180	$921,213	$39,161,945	$654,968	$27,843,540
CA 17B. Vandenberg South	$202,889	$8,625,070	$219,745	$9,341,645	$244,156	$8,578,724	$1,244,780	$52,917,180	$921,213	$39,161,945	$654,968	$27,843,540
CA 18. Devereaux Beach	$188,659	$1,293,570	$206,092	$1,413,099	$231,554	$1,587,688	$1,031,992	$7,076,019	$763,737	$5,236,686	$543,006	$3,723,203
CA 21A. Santa Monica Beach	$0	$0	$0	$0	$0	$0	$6,490,956	$6,490,956	$4,803,704	$4,803,704	$3,415,360	$3,415,360
CA 21B. Dockweiler N	$0	$0	$0	$0	$0	$0	$20,363,007	$20,363,007	$15,069,869	$15,069,869	$10,714,445	$10,714,445
CA 21C. Dockweiler S	$0	$0	$0	$0	$0	$0	$20,363,007	$20,363,007	$15,069,869	$15,069,869	$10,714,445	$10,714,445
CA 21D. Hermosa Beach	$0	$0	$0	$0	$0	$0	$41,792,790	$41,792,790	$30,929,217	$30,929,217	$21,990,197	$21,990,197
CA 27C. Silver Strand	$2,424,951	$11,531,852	$2,581,143	$12,274,622	$2,799,670	$13,313,829	$17,264,255	$82,100,144	$12,776,603	$60,759,121	$9,083,968	$43,198,799
Subtotal Proposed Units	**$27,816,268**	**$242,027,969**	**$29,705,737**	**$281,328,209**	**$32,383,005**	**$343,626,801**	**$467,879,144**	**$1,158,230,523**	**$346,161,780**	**$857,164,589**	**$246,013,748**	**$609,433,786**

Exhibit 4-1 (continued)

TOTAL RECREATIONAL LOSSES ESTIMATED BY UNITS IN POTENTIAL CRITICAL HABITAT FOR THE PLOVER

	Past Losses						Future Losses					
	Constant Dollars		Present Value (3%)		Present Value (7%)		Constant Dollars		Present Value (3%)		Present Value (7%)	
Unit	**Method 2**	**Method 1**	**Method 2**	**Method 1**	**Method 2**	**Method 1**	**Method 2**	**Method 1**	**Method 2**	**Method 1**	**Method 2**	**Method 1**
Areas identified for possible inclusion												
OR 1A. Columbia River Spit	$0	$0	$0	$0	$0	$0	$909,369	$8,067	$674,214	$5,981	$478,129	$4,242
OR 2. Nehalem River Spit	$0	$0	$0	$0	$0	$0	$2,311,714	$578,052	$1,713,924	$428,573	$1,215,455	$303,929
OR 4. Netarts Spit	$0	$0	$0	$0	$0	$0	$302,755	$0	$177,957	$0	$89,944	$0
OR 5B. Sand Lake South	$0	$0	$0	$0	$0	$0	$775,442	$376,121	$531,362	$257,732	$334,292	$162,145
OR 8C. N Umpqua River Spit	$0	$0	$0	$0	$0	$0	$85,554	$89,923	$54,258	$57,029	$30,489	$32,046
OR 10C. Elk River Spit	$0	$0	$0	$0	$0	$0	$76,043	$5,089	$48,227	$3,227	$27,100	$1,813
OR 11. Euchre Creek Spit	$0	$0	$0	$0	$0	$0	$16,957	$0	$10,754	$0	$6,043	$0
OR 12. Pistol River Spit	$0	$0	$0	$0	$0	$0	$27,574	$0	$16,208	$0	$8,192	$0
Subtotal Possible Units	$0	$0	$0	$0	$0	$0	$4,505,409	$1,057,252	$3,226,903	$752,542	$2,189,642	$504,175

Note: Totals may not sum due to rounding.

140. Exhibit 4-1 demonstrates that, for some potential critical habitat areas, large ranges in the estimated costs of plover conservation efforts exist. The range results because two distinct methods are used to estimate potential pedestrian and equestrian visitor losses. The large variation between potential critical habitat areas can be attributed to a number of factors such as types of plover restrictions (i.e., pedestrian and equestrian, driving, and/or mechanized beach raking), number of visitors to the impacted beach, and the extent of plover restrictions (e.g., symbolic fencing varies greatly across beaches).

Additional Information for Coos Bay, Oregon

For Oregon, the analysis of lost visitor trips relies on beach visitation data collected as part of the Oregon Shores Recreational Use Study (see Section 4.4).[a] Researchers from Oregon State University traveled up and down defined beach segments along the coast counting visitors using a prescribed sampling schedule. The location of beach visitors was recorded using Global Positions System coordinates (GPS). As a result, this analysis uses highly-specific information about the number and location of visitors to Oregon's beaches derived from a data source that is consistent for all of the Oregon units considered in this analysis. For Unit OR-9 (Coos Bay North Spit), GPS data indicate that approximately 110 people annually visit the area proposed for critical habitat designation during the plover breeding season.

A Commissioner of Coos County expressed concern that the Oregon Shores Recreational Use Study undercounted recreators in the southern part of the State, and in particular at Coos Bay's North Spit.[b] In a letter submitted during the public comment period for the proposed rule, the commissioners of Coos County reference estimates of recreational consumer surplus losses resulting from the closure of the North Spit after the New Carissa oil spill in 1999. The damage assessment completed by the National Oceanic and Atmospheric Administration (NOAA) relied on a vehicle counter at a Bureau of Land Management (BLM) boat ramp located just north of Unit OR-9 (Coos Bay North Spit) and south of Unit OR-8D (Tenmile Creek Spit).[c] Based on assumptions used in NOAA's damage assessment regarding the average number of visitors per car, the vehicle counter suggests that as many as 18,400 people visited this area in 1998 during the plover breeding season.

Using the estimate of visitors from the BLM's vehicle counter, and assuming that half of the beach is inaccessible as a result of plover conservation efforts, approximately 9,200 trips would be lost annually. Assuming a welfare value of $30 per trip (see Section 4.4.1) results in present value losses of approximately $3.2 million between 2005 and 2025. In addition, assuming $51 in expenditures per trip (see Section 4.6), these lost trips could generate $780,000 in losses to the regional economy. However, it is unclear what proportion of the visitors using this parking lot are precluded from recreating in areas proposed for designation as a result of plover conservation efforts.

[a] Shelby, Bo and John Tokarczyk. 2002. Oregon Shores Recreational Use Study. Prepared for Oregon Parks and Recreation Department.

[b] Personal communication with John Griffith, Chairman of the Coos County Board of Commissioners, December 7, 2004.

[c] Carlson, Curtis and Robert Fujimoto. October 2001. New Carissa Recreational Loss Pre-Assessment report. Prepared by NOAA and the U.S. Department of Agriculture Forest Service.

4.2 Background

141. Human recreational activities and beach maintenance activities designed to enhance recreational quality may disturb the plover.[96] Many of the beaches identified as potential critical habitat for the plover allow public access for recreation. All but 15 out of 82 of the potential critical habitat subunits and areas allow some form of public access. Exhibit 4-2 presents the names of the public beaches and the managers of those beaches that are within potential critical habitat. Most access is provided by Federal, State, and local municipal owners and managers, however some private owners also provide public access (e.g., at CA-7, the Dillon Beach Resort and Lawson's Landing Resort allow access for a nominal fee).

142. Various recreational activities are allowed on public beaches, such as walking, jogging, hiking, biking, walking with dogs, sunbathing, picnicking, sandcastle building, birding, photography, sand sailing, surfing, kayaking, windsurfing, jet skiing, boating, hang gliding, surf fishing, shellfish harvesting, beach combing, driving on the beach, horseback riding, beach cleaning (i.e., mechanical beach raking), fireworks displays, falconry, kite flying, and model airplane flying.[97] In general beach managers attempt to provide a variety of recreational experiences at beaches. Exhibits 4-3 through 4-6 present the types of recreational activities currently allowed at public beaches that contain potential critical habitat. Different types of human recreation disturb the plover to various degrees as described in the Draft Recovery Plan.

[96] U.S. Fish and Wildlife Service, *Proposed Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004.

[97] U.S. Fish and Wildlife Service, *Western Snowy Plover (Charadrius alexandrinus nivosus) Pacific Coast Population Draft Recovery Plan*, Portland, Oregon, 2001.

Exhibit 4-2

BEACHES LIKELY TO ALLOW PUBLIC ACCESS WITHIN POTENTIAL PLOVER CRITICAL HABITAT

Unit	Publicly Accessible Areas	Land Manager/Owner
Proposed for Designation		
WA 2. Damon Pt, Oyhut	Damon Point State Park; Oyhut State Wildlife Area	Washington State Parks; Washington Department of Natural Resources
WA 3. Midway Beach	South Beach State Park	Washington State Parks
WA 4. Leadbetter Pt	Leadbetter Point State Park	Washington State Parks
OR 3. Bayocean Spit	Public	Army Corps of Engineers
OR 7. Sutton/Baker Beaches	Siuslaw National Forest	Forest Service
OR 8A. Siltcoos River Spit	Oregon Dunes National Recreation Area	Forest Service
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	Oregon Dunes National Recreation Area	Forest Service
OR 8D. Tenmile Creek Spit	Oregon Dunes National Recreation Area	Forest Service
OR 9. Coos Bay N Spit	Coos Bay Shorelands	Bureau of Land Management; Army Corps of Engineers
OR 10A. Bandon to Floras Lake	Bandon State Park	Oregon Parks and Recreation Department
CA 1. Lake Earl	Tolowa Dunes State Park	California State Parks
CA 2. Big Lagoon	Humboldt Lagoons State Park; Big Lagoon County Park	California State Parks; Humboldt County
CA 3A. Clam Beach/Little Riv	Little River State Beach; Clam Beach County Park	California State Parks; Humboldt County
CA 3B. Mad River	Clam Beach County Park; Mad River County Park	Humboldt County
CA 4A. Humboldt Bay, S Spit	Eel River Wildlife Area	California Department of Fish and Game; Bureau of Land Management
CA 4B. Eel Riv N Spit & Beach	Eel River Wildlife Area	California Department of Fish and Game
CA 5. MacKerricher Beach	MacKerricher State Park	California State Parks
CA 6. Manchester Beach	Manchester State Park	California State Parks
CA 7. Dillon Beach	Lawson's Landing, Dillon Beach Resort	Private
CA 8. Pt Reyes Beach	Point Reyes National Seashore	National Park Service
CA 9. Limantour Spit	Point Reyes National Seashore	National Park Service
CA 10. Half Moon Bay	Half Moon Bay State Beach	California State Parks
CA 11C. Wilder Cr. Beach	Wilder Ranch State Park	California State Parks
CA 12A. Jetty Rd to Aptos	Manresa State Beach; Moss Landing State Beach; Sunset State Beach; Zmudowski State Beach	California State Parks
CA 12B. Elkhorn Sl Mudflat	Moss Landing Wildlife Area	California Department of Fish and Game
CA 12C. Monterey to Moss Lnd	Fort Ord Military Reservation; Marina State Beach; Monterey State Beach; Salinas River National Wildlife Refuge; Salinas River State Beach	California State Parks; Service
CA 13. Pt Sur Beach	Point Sur State Historic Park	California State Parks

Exhibit 4-2

BEACHES LIKELY TO ALLOW PUBLIC ACCESS WITHIN POTENTIAL PLOVER CRITICAL HABITAT

Unit	Publicly Accessible Areas	Land Manager/Owner
CA 14. San Simeon Beach	San Simeon State Park	California State Parks
CA 15A. Villa Cr Beach	Estero Bay	California State Parks
CA 15B. Atascadero Beach	Morro Strand State Beach	California State Parks
CA 15C. Morro Bay Beach	Montana De Oro State Park	California State Parks
CA 16. Pismo Beach/Nipomo	Oceano Dunes State Vehicular Recreation Area; Pismo State Beach; Guadalupe-Nipomo Dunes Preserve	California State Parks; Nature Conservancy
CA 17A. Vandenberg North	Vandenberg Air Force Base	Department of Defense
CA 17B. Vandenberg South	Vandenberg Air Force Base	Department of Defense
CA 18. Devereaux Beach	Coal Oil Point	University of California Los Angeles
CA 19A. Mandalay to Santa Clara	Mandalay State Beach; McGrath State Beach	California State Parks
CA 19D. Mugu Lagoon S.	Point Mugu State Park	California State Parks
CA 20. Zuma Beach	Zuma County Beach	Los Angeles County
CA 21A. Santa Monica Beach	Will Rogers State Beach	Los Angeles County
CA 21B. Dockweiler N.	Dockweiler State Beach	Los Angeles County
CA 21C. Dockweiler S.	Dockweiler State Beach	Los Angeles County
CA 21D. Hermosa Beach	Hermosa City Beach	City of Hermosa
CA 22A. Bolsa Chica Reserve	Bolsa Chica Ecological Reserve	California Department of Fish and Game
CA 22B. Huntington St. Beach	Bolsa Chica State Beach	California State Parks
CA 23. Santa Ana River Mouth	Huntington State Beach	California State Parks
CA 24. San Onofre St Beach	San Onofre State Beach	California State Parks
CA 25A. Batiquitos West	South Carlsbad State Beach	California State Parks
CA 26. Los Penasquitos	Torrey Pines State Beach	California State Parks
CA 27C. Silver Strand	Silver Strand State Beach	California State Parks
CA 27E. Sweetwater NWR	Sweetwater Marsh National Wildlife Refuge	Service
CA 27F. Tijuana River Beach	Border Field State Park; Tijuana Slough National Wildlife Refuge	California State Parks; Service
Areas Identified for Possible Inclusion		
WA 1. Copalis Spit	Griffith Priday State Park	Washington State Parks
OR 1A. Columbia River Spit	Fort Stevens State Park	Oregon Parks and Recreation Department
OR 1B. Necanicum River Spit	Gearhart Ocean State Recreation Area	Oregon Parks and Recreation Department
OR 2. Nehalem River Spit	Nehalem Bay State Park	Oregon Parks and Recreation Department
OR 4. Netarts Spit	Cape Lookout State Park	Oregon Parks and Recreation Department
OR 5A. Sand Lake North	(Un-named)	Tillamook County
OR 6. Nestucca River Spit	Robert W. Straub State Park	Oregon Parks and Recreation Department
OR 8C. N Umpqua River Spit	Oregon Dunes National Recreation Area	Forest Service
OR 10B. Sixes River Spit	Cape Blanco State Park	Oregon Parks and Recreation Department

Exhibit 4-2

BEACHES LIKELY TO ALLOW PUBLIC ACCESS WITHIN POTENTIAL PLOVER CRITICAL HABITAT

Unit	Publicly Accessible Areas	Land Manager/Owner
OR 12. Pistol River Spit	Pistol River State Park	Oregon Parks and Recreation Department
CA 11A. Waddell Cr Beach	Big Basin Redwoods State Park	California State Parks
Areas Proposed for Exclusion		
Salinas River National Wildlife Refuge	Salinas River National Wildlife Refuge	Service
Guadalupe/Nipomo Dunes National Wildlife Refuge	Guadalupe/Nipomo Dunes National Wildlife Refuge	Service

Sources: U.S. Fish and Wildlife Service, *Proposed Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004. GIS analysis performed by IEc.

Exhibit 4-3

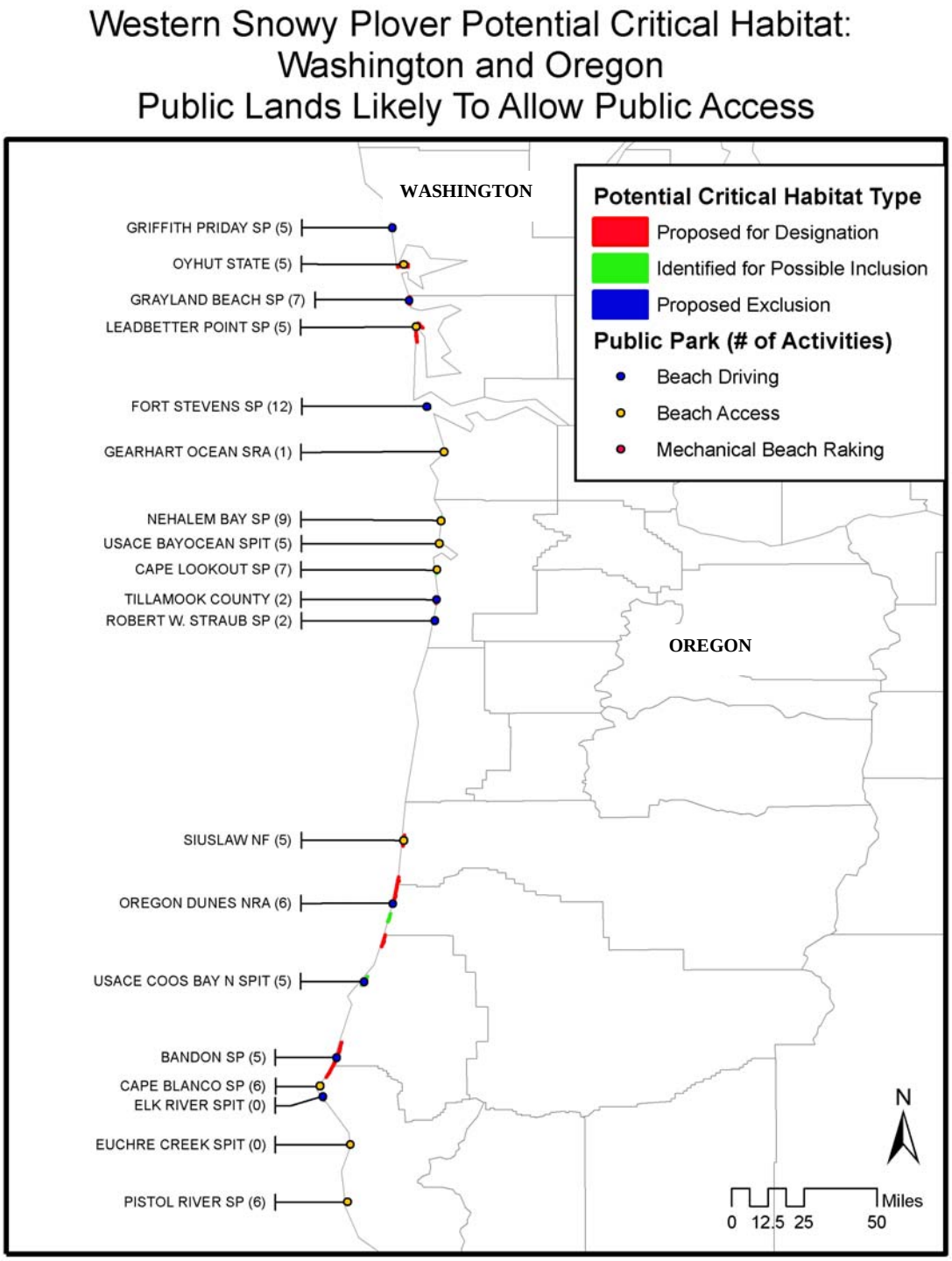
Western Snowy Plover Potential Critical Habitat:
Washington and Oregon
Public Lands Likely To Allow Public Access
WASHINGTON
OREGON
Potential Critical Habitat Type
Proposed for Designation
Identified for Possible Inclusion
Proposed Exclusion
Public Park (# of Activities)
Beach Driving
Beach Access
Mechanical Beach Raking
GRIFFITH PRIDAY SP (5)
OYHUT STATE (5)
GRAYLAND BEACH SP (7)
LEADBETTER POINT SP (5)
FORT STEVENS SP (12)
GEARHART OCEAN SRA (1)
NEHALEM BAY SP (9)
USACE BAYOCEAN SPIT (5)
CAPE LOOKOUT SP (7)
TILLAMOOK COUNTY (2)
ROBERT W. STRAUB SP (2)
SIUSLAW NF (5)
OREGON DUNES NRA (6)
USACE COOS BAY N SPIT (5)
BANDON SP (5)
CAPE BLANCO SP (6)
ELK RIVER SPIT (0)
EUCHRE CREEK SPIT (0)
PISTOL RIVER SP (6)
N
Miles
0 12.5 25 50

Exhibit 4-4

Western Snowy Plover Potential Critical Habitat:
Northern California Public Lands Likely To Allow Public Access

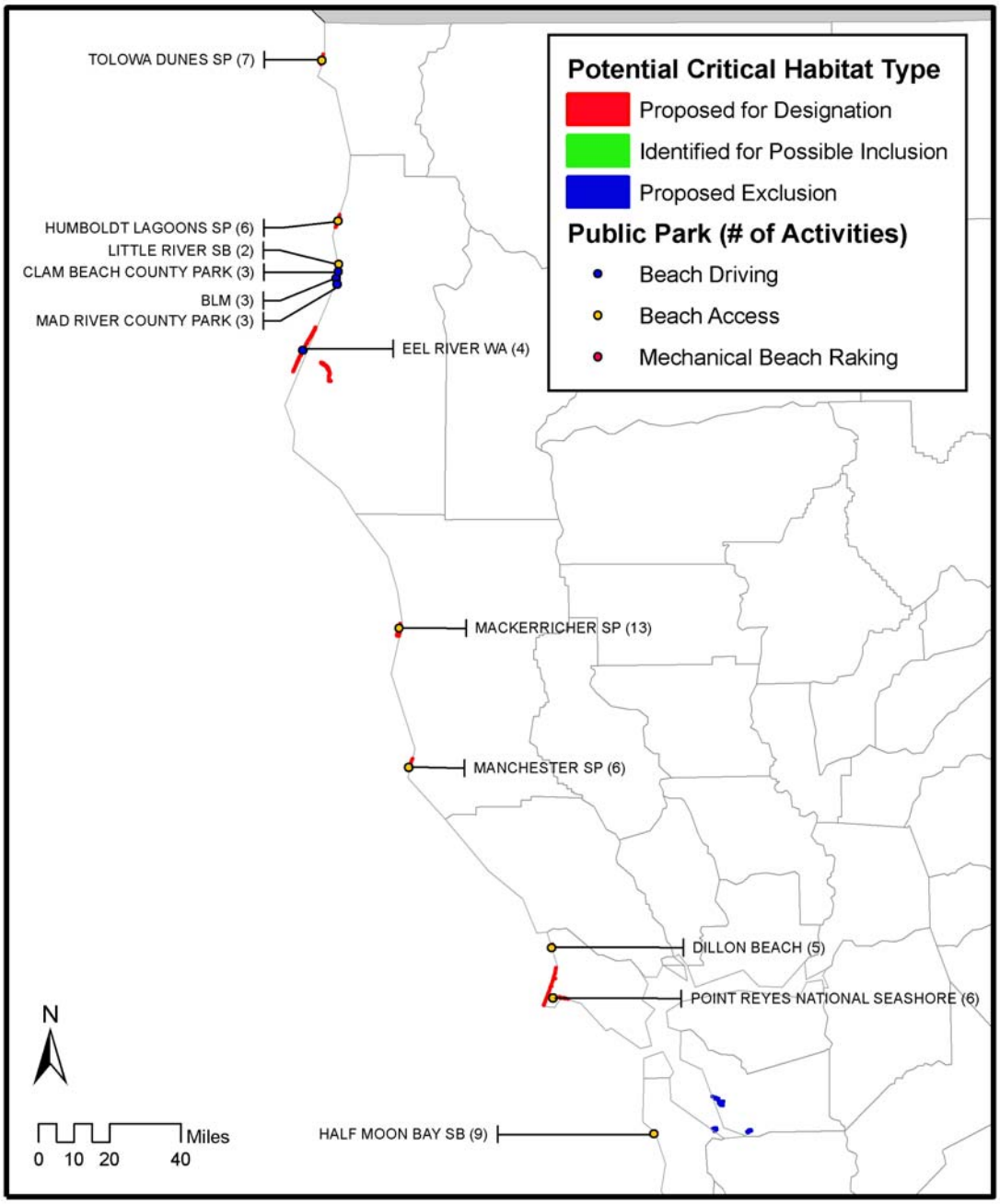

Exhibit 4-5

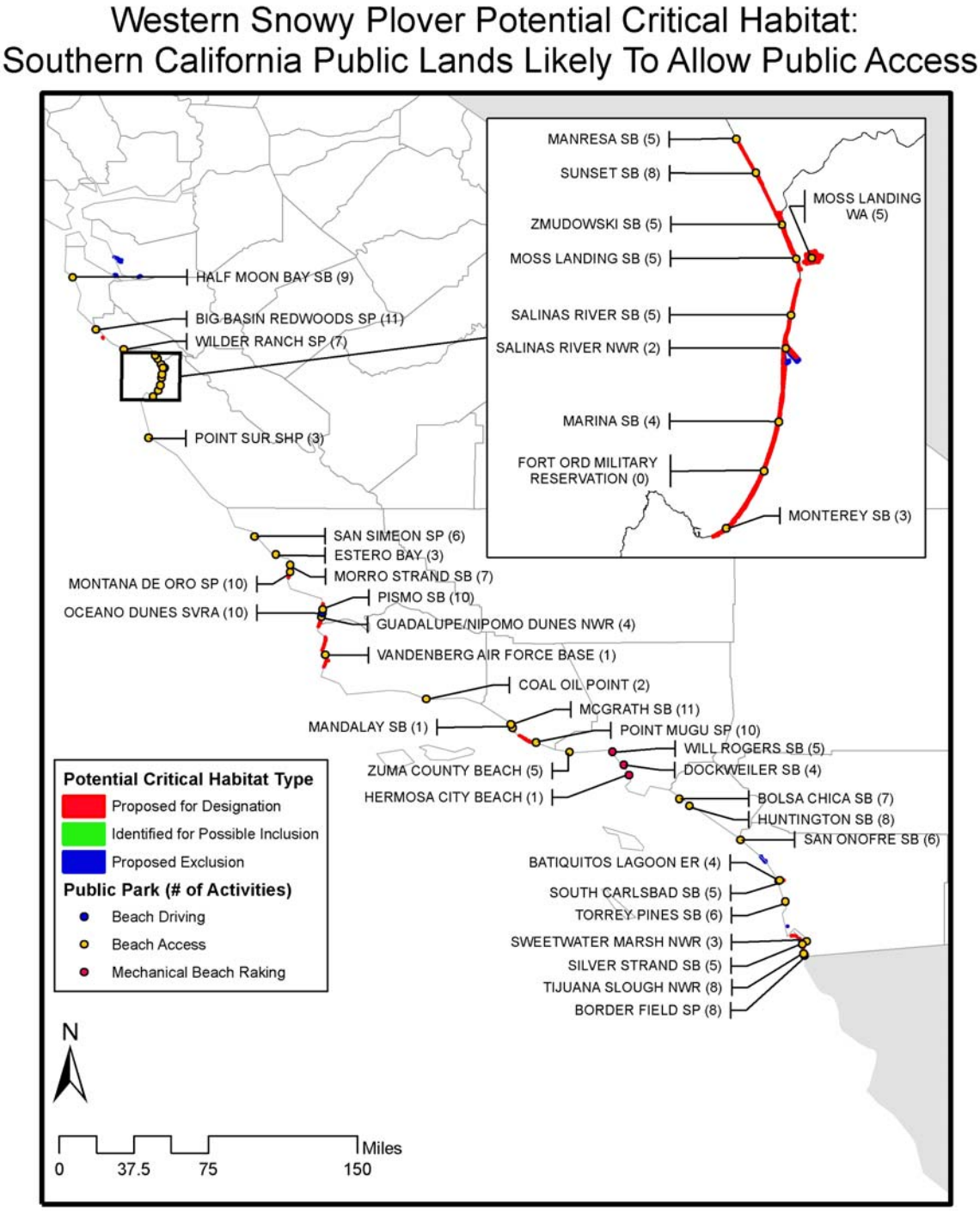
Western Snowy Plover Potential Critical Habitat:
Southern California Public Lands Likely To Allow Public Access
MANRESA SB (5)
SUNSET SB (8)
MOSS LANDING WA (5)
ZMUDOWSKI SB (5)
MOSS LANDING SB (5)
SALINAS RIVER SB (5)
SALINAS RIVER NWR (2)
MARINA SB (4)
FORT ORD MILITARY RESERVATION (0)
MONTEREY SB (3)
HALF MOON BAY SB (9)
BIG BASIN REDWOODS SP (11)
WILDER RANCH SP (7)
POINT SUR SHP (3)
SAN SIMEON SP (6)
ESTERO BAY (3)
MORRO STRAND SB (7)
MONTANA DE ORO SP (10)
PISMO SB (10)
OCEANO DUNES SVRA (10)
GUADALUPE/NIPOMO DUNES NWR (4)
VANDENBERG AIR FORCE BASE (1)
COAL OIL POINT (2)
MCGRATH SB (11)
MANDALAY SB (1)
POINT MUGU SP (10)
WILL ROGERS SB (5)
ZUMA COUNTY BEACH (5)
DOCKWEILER SB (4)
HERMOSA CITY BEACH (1)
BOLSA CHICA SB (7)
HUNTINGTON SB (8)
SAN ONOFRE SB (6)
BATIQUITOS LAGOON ER (4)
SOUTH CARLSBAD SB (5)
TORREY PINES SB (6)
SWEETWATER MARSH NWR (3)
SILVER STRAND SB (5)
TIJUANA SLOUGH NWR (8)
BORDER FIELD SP (8)
Potential Critical Habitat Type
Proposed for Designation
Identified for Possible Inclusion
Proposed Exclusion
Public Park (# of Activities)
Beach Driving
Beach Access
Mechanical Beach Raking
N
0
37.5
75
150
Miles

Exhibit 4-6

KEY TO THE ACTIVITIES AVAILABLE AT EACH PUBLICALLY ACCESSIBLE AREA IN POTENTIAL PLOVER CRITICAL HABITAT

Park Name	Potential Critical Habitat Unit/Area	Activities	Facilities
California			
Batiquitos Lagoon Ecological Reserve	CA 25B. Batiquitos Middle	BA, F, T, WV	
Big Basin Redwoods State Park	CA 11A. Waddell Cr Beach	BA, C, H, HS, PR, T, TR, SW, WS, WV	FS, L, PN, RR, RV, VC
BLM managed Humboldt Bay South Spit	CA 4A. Humboldt Bay S Spit	BA, F, SF	-
Bolsa Chica State Beach	CA 22B. Huntington St. Beach	BA, F, HA, T, SF, SW	FS, PN, RR, RV
Border Field State Park	CA 27F. Tijuana River Beach	BA, F, H, PR, T, SW, VW, WV	PK, RR, VC
Clam Beach County Park	CA 3A. Clam Beach/Little Riv	BA, C, F	-
Coal Oil Point	CA 18. Devereaux Beach	BA, SF	-
Dillon's Beach Resort and Lawson's Landing	CA 7. Dillon Beach	BA, C, CL, F, SW	-
Dockweiler State Beach	CA 21B. Dockweiler N, 21C Dockweiler S	BA, T, SF, SW	PN, RR, SH
Eel River Wildlife Area	CA 4B. Eel Riv N Spit and Beach	BA, F, HT, WV	-
Estero Bay	CA 15A. Villa Cr Beach	BA, T, TR	-
Fort Ord Military Reservation	CA 12C. Monterey to Moss Lnd	Currently closed, this is the site of a future park.	-
Guadalupe/Nipomo Dunes National Wildlife Refuge	Guadalupe/Nipomo Dunes National Wildlife Refuge	BA, F, T, WV	-
Half Moon Bay State Beach	CA 10. Half Moon Bay	BA, C, F, H, HA, PR, T, WV	PK, PN, RR, RV, SH, VC
Hermosa City Beach	CA 21D. Hermosa Beach	BA	-
Humboldt Lagoons State Park	CA 2. Big Lagoon	BA, C, F, PR, T, WS	BR, PN, VC
Huntington State Beach	CA 23. Santa Ana River Mouth	BA, F, HA, T, SW, WS, WV	FS, PN, RR, RV
Little River State Beach	CA 3A. Clam Beach/Little Riv	BA, F	-
MacKerricher State Park	CA 5. Mackerricher Beach	BA, C, F, H, HS, PR, T, TR, SD, SW, VW, WV	PN, RR, RV, SH, VC
Mad River County Park	CA 3B. Mad River	BA, F, H	BR, PK, PN, RR
Manchester State Park	CA 6. Manchester Beach	BA, C, F, T, WV	PN, RV
Mandalay State Beach	CA 19A. Mandalay to Santa Clara	BA	-
Manresa State Beach	CA 12A. Jetty Rd to Aptos	BA, C, F, TR, SW	-
Marina State Beach	CA 12C. Monterey to Moss Lnd	BA, F, PR, T	FS, PK, PN, RR
McGrath State Beach	CA 19A. Mandalay to Santa Clara	BA, C, F, HA, PR, T, TR, SW, VW, WV	RV, VC
Montana De Oro State Park	CA 15C. Morro Bay Beach	BA, C, F, H, HS, PR, T, TR, WV	PK, PN, RR, RV, VC
Monterey State Beach	CA 12C. Monterey to Moss Lnd	BA, F, T	PK, PN, RR

Exhibit 4-6

KEY TO THE ACTIVITIES AVAILABLE AT EACH PUBLICALLY ACCESSIBLE AREA IN POTENTIAL PLOVER CRITICAL HABITAT

Park Name	Potential Critical Habitat Unit/Area	Activities	Facilities
Morro Strand State Beach	CA 15B. Atascadero Beach	BA, C, F, SD, SF, WS	PN, RV
Moss Landing State Beach	CA 12A. Jetty Rd to Aptos	BA, F, H, T, WV	-
Moss Landing Wildlife Area	CA 12B. Elkhorn Sl Mudflat	BA, F, H, T, WV	-
Oceano Dunes State Vehicular Recreation Area	CA 16. Pismo Beach/Nipomo	BA, C, F, H, HA, PR, T, TR, SW	PK, PN, RR, RV, VC
Pismo State Beach	CA 16. Pismo Beach/Nipomo	BA, C, F, H, PR, T, TR, SW, WV	PK, PN, RR, RV, SH, VC
Point Mugu State Park	CA 19D. Mugu Lagoon S.	BA, C, F, H, HA, PR, T, SW, WV	PK, PN, RR, RV
Point Reyes National Seashore	CA 8. Point Reyes Beach, 9 Limantour Spit	BA, C, H, HS, PR, T, TR, WV	VC
Point Sur State Historic Park	CA 13. Point Sur Beach	BA, PR, TR	RR
Salinas River National Wildlife Refuge	Salinas River National Wildlife Refuge	BA, WV	-
Salinas River State Beach	CA 12C. Monterey to Moss Lnd	BA, F, H, T, WV	PN, RR
San Onofre State Beach	CA 24. San Onofre St Beach	BA, C, F, HA, T	PK, RV, SH
San Simeon State Park	CA 14. San Simeon Beach	BA, C, F, PR, T	BR, PK, PN, RR, RV, SH
Silver Strand State Beach	CA 27C. Silver Strand	BA, C, F, HA, SW	PK, PN, RR
South Carlsbad State Beach	CA 25A. Batiquitos West	BA, C, F, HA, PR, SW	FS, PN, RR, RV, SH
Sunset State Beach	CA 12A. Jerry Rd to Aptos	BA, C, F, H, HA, T, TR, SW	PN, RR, RV
Sweetwater Marsh National Wildlife Refuge	CA 27E. Sweetwater NWR	BA, PR, WV	-
Tijuana Slough National Wildlife Refuge	CA 27F. Tijuana River Beach	BA, F, H, PR, T, SW, VW, WV	PK, PN, RR, VC
Tolowa Dunes State Park	CA 1. Lake Earl	BA, C, F, H, T, TR, WV	BR, PN
Torrey Pines State Beach	CA 26. Los Penasquitos	BA, F, HA, PR, T, SW	PK, PN, RR
Vandenberg Air Force Base	CA 17A. Vandenberg North, 17B Vandenberg South	BA	-
Wilder Ranch State Park	CA 11C. Wilder Cr Beach	BA, H, HS, PR, T, TR, WS	PK, PN, RR, VC
Will Rogers State Beach	CA 21A. Santa Monica Beach	BA, F, T, SF, SW	PN, RR, SH
Zmudowski State Beach	CA 12A. Jetty Rd to Aptos	BA, F, H, T, WV	-
Zuma County Beach	CA 20. Zuma Beach	BA, F, SD, SF, SW	FS, PK, RR, SH
Oregon			
Bandon State Park	OR 10A. Bandon to Floras Lake	BA, F, T, VW, WV	PN, RR
Cape Blanco State Park	OR 10B. Sixes River Spit	BA, F, H, T, WV	L, PN, RR, RV, SH
Cape Lookout State Park	OR 4. Netarts Spit	BA, C, F, PR, VW, WV	PK, PN, RR, RV, SH

Exhibit 4-6

KEY TO THE ACTIVITIES AVAILABLE AT EACH PUBLICALLY ACCESSIBLE AREA IN POTENTIAL PLOVER CRITICAL HABITAT

Park Name	Potential Critical Habitat Unit/Area	Activities	Facilities
Elk River Spit	OR 10C. Elk River Spit	(No public access)	-
Euchre Creek Spit	OR 11. Euchre Creek Spit	(No public access)	-
Fort Stevens State Park	OR 1A Columbia River Spit	BA, C, F, H, HS, PR, T, TR, SW, WS, WV	BR, FS, L, PK, PN, RR, RV, SH, VC
Gearhart Ocean State Recreation Area	OR 12. Pistol River Spit	BA	-
Nehalem Bay State Park	OR 2. Nehalem River Spit	BA, C, F, H, PR, T, WS, WV	BR, PN, RR, RV, SH
Oregon Dunes National Recreation Area	OR 8A. Siltcoos River Spit OR 8B. Dunes overlook/Tahkenit	BA, C, F, H, T, SD	BR
Pistol River State Park	OR 12. Pistol River Spit	BA, F, H, T, WS, WV	-
Robert W. Straub State Park	OR 6. Nestucca River Spit	BA, F	PN, RR
Siuslaw National Forest	OR 7. Sutton/Baker Beaches	BA, C, H, T, WV	BR, PN, RR
Tillamock County	OR 5A. Sand Lake North	BA, C	PK, PN, RR
USACE managed Bayocean Spit	OR 3. Bayocean Spit	BA, H, HS, T, WV	-
Ocean Shores	OR 9. Coos Bay N Spit	BA, CL, H, T, WV	-
Washington			
Grayland Beach State Park	WA 3. Midway Beach	BA, C, CL, F, T, PR, WV	-
Griffith Priday State Park	WA 1. Copalis Spit	BA, CL, F, T, WV	L, PK, PN, RR
Leadbetter Point State Park	WA 4. Leadbetter Pt	BA, CL, F, T, WV	BR, PK, RR
Oyhut State Wildlife Area	WA 2. Damon Pt, Oyhut	BA, CL, F, T, WV	PN

Activities

BA - Beach Access; C – Camping; CL – Clamming; F – Fishing; H - Horseback Trails; HA - Beach Wheelchair; HS – Historical; HT – Hunting; PR - Exhibits and Programs; T - Trails (Bike, Hiking, Nature); TR - Guided Tours; SD - Scuba Diving; SF – Surfing; SW – Swimming; VW - Vista Point; WS – Windsurfing; WV - Wildlife Viewing

Facilities

BR - Boat Ramps; FS - Food Service & Supplies; L - Lodging PK – Parking; PN - Picnic Areas; RR – Restrooms; RV – Recreational Vehicles (Campers, RV Dump Station, RV Hookups, Trailers); SH – Showers; VC - Visitor Center

Sources: Publicly-available internet sites for these beaches provided by Washington State Parks, Wildernet, the Forest Service, Oregon Travels Visitor Guide, California State Parks, Humboldt County, National Park Service, Los Angeles County Department of Beaches and Harbors, Batiquitos Foundation, and Oregon State Parks.

143. Measures to protect the plover were first implemented in 1990 when nest exclosures were erected in Monterey Bay.[98] Since then, other plover conservation efforts have been implemented throughout California, Oregon, and Washington. Major plover conservation efforts that may impact recreation include symbolic fencing, nest exclosures, signage, driving restrictions, and mechanized beach cleaning restrictions. Exhibit 3-1 presented previously in Section 3 of this report provides a timeline of the plover conservation efforts implemented by beach managers in potential critical habitat areas.[99]

4.3 Estimating the Loss Associated with Reduced Recreational Opportunities

144. This analysis measures the impact of plover management activities on beach recreators. Conservation efforts resulting in access restrictions or restrictions on the types of activities taking place at plover beaches may diminish the quality of the recreational experience or reduce recreational opportunities for pedestrians, equestrians, and/or visitors relying on motor vehicles. In addition, less frequent mechanized beach-cleaning at beaches in southern California may diminish the experience of visiting these sites.

145. In his 2003 book, *The Measurement of Environmental and Resource Values*, A. Myrick Freeman explains that natural resources are valuable assets that yield flows of services to people.[100] Types of services may include: (1) material inputs to the economy such as fossil fuels, wood products, minerals, water, and fish; (2) life-support services such as breathable air or a livable climate; (3) amenity services such as opportunities for recreation, wildlife observation, or scenic views; and (4) the ability to disperse, transform, and store residuals generated as the by-product of economic activity.

146. The economic value of a natural resource, such as a beach, "resides in the contributions that the ecosystem functions and services make to human well-being."[101]

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[98] Symbolic fencing consists of one or two strands of light-weight string or cable tied between posts to delineate areas where pedestrians should not enter, typically extending to the high tide line. Nest exclosures are small metal fences that are designed to keep predators out of nests. Signs inform the public of closed areas, nesting and wintering sites, etc.

[99] The Draft Recovery Plan estimates the total cost of recovery in the plover recovery units will be $28.6 million plus additional costs that cannot be estimated at this time. The costs of plover recovery estimated in the Draft Recovery Plan are different than those quantified in this analysis and cannot be compared. The quantified costs of plover recovery included in the Draft Recovery Plan include monitoring, predator control, establishing plover working groups, Service staff time for coordinating recovery, developing higher-efficiency nest exclosures, developing sampling methods for estimating reproductive success, reviewing progress toward recovery success, improving the submittal system for monitoring data, coordinating monitoring of plover and California least terns, developing training programs for enforcement personnel, providing wardens to enforce wintering measures, investigating predator management at the landscape level, and identifying components of high quality brood habitat. In addition, the recovery units incorporate a larger geographic area than the proposed CHD. U.S. Fish and Wildlife Service. 2001. Western Snowy Plover (*Charadrius alexandrinus nivosus)* Pacific Coast Population Draft Recovery Plan. Portland, Oregon.

[100] Freeman, A. Myrick, *The Measurement of Environmental and Resource Values: Theory and Methods* (2nd ed.), Resources for the Future Press: Washington, DC, 2003, p. 2 - 5.

[101] Ibid., p. 7.

Public policy that changes the services provided by a natural resource, whether a positive or a negative change, results in a change in the value of the system as an asset. This change is measured in terms of the change of individuals' well-being (also referred to as "welfare").

147. Economic theory assumes that "people have well-defined preferences among alternative bundles of goods, where bundles consist of various quantities of both market and nonmarket goods."[102] The magnitude of the affect of a public policy that alters the services provided by natural resources depends on people's preferences for varying bundles of goods and services and the availability of substitute services. Regarding preferences, economists assume that "a bundle with a larger quantity of an element will be preferred to a bundle with a smaller quantity of that element, other things being equal."[103] In other words, access to more beach is preferable to less beach, and therefore more highly valued, all other things being equal. Economists also assume that it is possible to increase the quantity of another service or good sufficiently to make the individual indifferent between two bundles.[104] If substitute goods or services are readily available to compensate for the reduction in services resulting from a public policy, then the change in value of the natural resource will be small, possibly immeasurable.

148. The challenge in this analysis is understanding how plover conservation activities affect the types of services provided by beaches in California, Oregon, and Washington, and the trade-offs necessary to make recreators whole. Restrictions may reduce the availability of certain sections of the beach (e.g., the high dunes) for recreation, increase the density of visitors in unrestricted sections of the beach, prohibit certain activities (e.g., dog running, kite flying, driving), make access to the beach more challenging (e.g., forcing people to walk long distances around fencing), or increase unpleasant odors or the number of insects at a site (e.g., if mechanical beach-raking is done less frequently).[105]

149. However, sufficient alternatives may be present at these or other local beaches that greatly reduce potential lost value resulting from plover management. For example, at approximately 75 percent of the beaches proposed for CHD, less than ten percent of length of the beach is fenced to protect the plovers. Also, the birds tend to nest above the high tide line, where the sand is soft, making walking or driving difficult. As a result, recreators whose primary activity on the beach is walking, horseback riding, or driving street-legal vehicles to access surfing or fishing sites and who would normally use the

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[102] Ibid., p. 8.

[103] Freeman, A. Myrick, "Economic Valuation: What and Why," in *A Primer on Nonmarket Valuation*, Patricia A. Champ, Kevin J. Boyle, and Thomas C. Brown (Eds.), Kluwer Academic Publishers: Dordrecht, Netherlands, 2003, p. 11.

[104] Ibid., p. 11.

[105] Conversely, plover conservation efforts may result in improved conditions for bird-watching, for example by increasing the possibility of a plover viewing for birders. Because the beaches considered in this analysis are already occupied by the plover, the extent to which ongoing future plover conservation efforts may increase participation in birding activities is uncertain. Further, the level of increase in likelihood of viewing a plover, and the effect of that increased likelihood on the overall quality of a birding trip, are equally uncertain. As a result, this analysis acknowledges the potential for, but does not quantify benefits to the birding community of plover conservation efforts.

firmer wet sand may not be affected in a measurable way by fencing.[106] In addition, many of the beaches considered in this analysis are in northern California, Oregon, and Washington, at locations with low density recreational use. Therefore, crowding resulting from fencing is less likely to be an issue in these areas. Finally, some evidence exists in the literature to suggest that plovers prefer locations on beaches that are removed from heavy human traffic.[107]

150. Conversely, interviews with interest groups and beach managers provide information suggesting that plover conservation efforts may affect the activities allowed at beaches more significantly. For example, the Friends of Oceano Dunes, a group that supports vehicular recreation at Oceano Dunes State Vehicular Recreation Area (ODSVRA), writes "the reduction of the historic use of the beach from 15-20 miles to 3.5 miles is making Oceano Dunes SVRA less attractive as a park. Camping is being concentrated in a much smaller area so that the camping and beach experience for visitors of the park is being significantly negatively affected."[108] In addition, activity restrictions (e.g., dog walking, kite flying) may affect the choices people make about which beaches to visit.[109] To further complicate the assessment of responses by beach visitors to plover protections, the location and amount of fencing for plovers changes each year as the location of nests changes. Representatives of both California State Parks and the Oregon Parks and Recreation Department stated that in some years, fencing may come down to the high tide line, making it difficult to get around the fencing during periods of high

[106] Personal communication with Michelle Michaud, Oregon Parks and Recreation Department, on December 6, 2004; personal communication with Cark Frounfelker, Siuslaw National Forest, on December 6, 2004; email communication with the Service's Arcata Field Office dated May 2, 2005; email communication with the Service's Ventura Field Office dated May 2, 2005; email communication with the Service's Carlsbad Field Office dated May 2, 2005; email communication with the Service's Newport Field Office dated May 5, 2005; and email communication with the Service's Sacramento Field Office dated May 2, 2005.

[107] In a study of the effect of human disturbance on wintering plovers, a researcher finds that "[d]isturbance appeared to alter the spatial distribution of plovers at Devereux [a beach near Devereux Slough in Santa Barbara, California]. Roosting plovers were less abundant near the heads of beach trails, suggesting that repeated foot traffic degraded these areas for plovers so that plovers avoided them." (Lafferty, Kevin D., "Disturbance to wintering western snowy plovers," *Biological Conservation* 101:315-325, 2001.)

[108] "Petition to Exclude Limited Areas from the Proposed Critical Habitat Designation for the Western Snowy Plover (Oceano Dunes SVRA)," submitted by Tom Roth, Lawyer for Friends of Oceano Dunes, dated February 7, 2005. Note that the closures referred to in this petition result in part from a settlement agreement between the Service and the Sierra Club, which sued the Service for failing to protect endangered and threatened species at this site.

[109] California State Parks requires that all dogs be leashed, however, enforcement of this regulation at every State park is not possible due to resource constraints. A representative of California State Parks stated that enforcement resources are targeted at beaches identified in the plover recovery plan and that are part of the existing CHD. A "zero tolerance" policy is followed; if a person does not put a leash on his dog, he is asked to leave the beach. (Personal communication with David Schaub, California State Parks, on December 3, 2004.) In addition, the draft Statewide habitat conservation plan (HCP) prepared by the Oregon Parks and Recreation Department proposes to prohibit dogs in occupied plover management areas. (*Habitat Conservation Plan for the Western Snowy Plover*, prepared by Oregon Natural Heritage Information Center and Oregon Parks and Recreation Department, 2004, p. 104.)

tide.[110] Finally, two of the subunits considered in this analysis are closed completely to recreators during plover breeding season.[111]

151. Ideally, this analysis would use an economic model of recreators' preferences for different beach locations and activities to predict how beach visitation and enjoyment might change as a result of plover protections and to estimate associated welfare losses. For example, as a result of restrictions at one beach, recreators may decide to go to a second-best location on that beach, go to their usual location but experience a diminished trip, visit a less-preferred beach, or decide not to take a beach trip at all. The welfare loss associated with each option, measured in terms of a decrease in consumer surplus, will vary depending on the beach-goers' value of his first choice beach experience and alternatives.[112] The National Marine Fisheries Service (NOAA) is currently developing such a model for recreational beach use in Southern California, however at this time it is not available for public use.[113] If the model becomes available prior to the completion of this report, then, time permitting, it will be incorporated into this analysis.

152. Because the information necessary to measure the change in value to beach recreators resulting from plover protections is not available, this analysis employs two alternative methods to estimate the potential magnitude of their loss. The first method is used to estimate losses to pedestrians, equestrians, and people who drive on the beach. It assumes that as a result of plover restrictions, recreators take fewer trips to the beach and assigns a value obtained from the published economics literature to those lost beach trips. The calculations rely on publicly available information about the number of visitors to these sites, the types of activities undertaken by these visitors, and the extent of fencing currently protecting plovers.[114] The availability of substitutes is considered for beaches with very limited restrictions (i.e., at sites where the amount of plover fencing is small, this analysis assumes that recreators can easily use other sites of the beach, resulting in negligible welfare losses).

153. By assuming that fewer people visit beaches as a result of plover restrictions, this analysis overstates welfare losses at sites where substitutes are not considered. However, because estimated impacts are directly proportional to visitor density, the types of activities undertaken by visitors, and the severity of restrictions, it likely provides

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[110] Personal communication with David Schaub, California State Parks, on December 3, 2004; and email communication with Michelle Michaud, Oregon Parks and Recreation Department, on April 19, 2005.

[111] "Biological Opinion for Beach Management and the Western Snowy Plover on Vandenberg Air Force Base for the 2001 Breeding Season (1-8-01-F-13)," U.S. Fish and Wildlife Service, March 9, 2001.

[112] Consumer surplus refers to the sum of an individual's maximum willingness to pay for services provided by a given natural resource, net of any costs associated with consuming those services.

[113] For more information on NOAA's model, see: http://marineeconomics.noaa.gov/SCBeach/welcome.html.

[114] Service biologists state that at most of the potential critical habitat areas, existing protections are sufficient to protect the growing populations of plovers anticipated in the Draft Recovery Plan and highlighted in the proposed critical habitat rule. However, they advise that additional protective measures will be necessary at sites in Oregon that are considered for inclusion in the final rule and at CA8 – Point Reyes. At these beaches, the analysis assumes that future protective measures will increase in scope during the time frame for this analysis. (Email communication from the Service's Washington office on June 8, 2005 and telephone communication with biologists from the Service's Sacramento Field Office, the Newport Field Office, the Portland Regional Office, and the Washington Office on June 10, 2005.)

credible comparisons of the *relative* magnitude of the economic impact of these regulations across beaches considered in the proposed rule.

154. The second method assumes that rather than losing beach trips, recreators visit their first choice site but have a diminished experience as a result of plover-related restrictions. This method provides an alternative estimate of impacts to pedestrians and equestrians of symbolic fencing and nest exclosures, and represents the primary estimate of impacts resulting from reduced mechanized beach raking at beaches in Southern California.[115] It relies on the same publicly available visitation information and activities mix as in the first method, and it assigns a value to these diminished trips obtained from the published economics on the marginal value of an additional mile of beach length.[116]

155. This second approach may overstate losses at beaches that are sparsely visited and where congestion is not likely to increase in a perceptible way as a result of fencing. However, it does not account for the losses associated with people who choose to visit a less-preferred beach or who make fewer trips. Note that the results of the two methods are not additive. In other words, the value of one aspect of a beach, in this case beach length, is part of the total value of a trip to that beach. Adding the value of lost trips to the value of a diminished trip would double-count welfare losses associated with plover protection.

156. Plover conservation efforts at many of the beaches included in this analysis are ongoing as a result of the listing and 1999 critical habitat designation and are likely to continue in the future. Costs are presented separately for past and future losses. The analysis does not make a distinction between costs resulting from earlier management decisions and the costs of future management choices.

157. The following subsections present a more detailed description of the methods used to estimate losses to recreators resulting from plover conservation efforts. The costs of implementing plover conservation efforts (e.g., fencing, monitoring, enforcement of beach use restrictions, etc.) are discussed in Section 3.[117] First, it discusses the estimate

[115] Based on the limited number of substitute sites available to recreators who drive on the beach, the assumption that these types of beach trips are lost is less likely to overstate impacts. Therefore, this analysis does not estimate losses associated with diminished trips for these users.

[116] As discussed later in this Section, several types of values of diminished beach loss were considered, including estimates of values associated with beach congestion, beach width, and the presence of cobblestones. Ultimately, losses are estimated based on people's preference for longer beaches, because this value is available in the peer reviewed literature for sites in California, and because sufficient data regarding the population experiencing the loss are readily available.

[117] One beach area is privately owned and provides access for a nominal fee. If plover conservation efforts reduced the number of visitors to this area the private property owners would experience a reduction in income. Income losses would be calculated by multiplying the number of foregone trips by the access fee. This analysis does not anticipate any reductions in income to private property owners. A reduction in recreational access is not reasonably foreseeable at this site. No projects resulting in access restrictions are currently planned. Section 4.4.1 discusses this issue in more detail.

of losses if beach trips are lost. Then, it discusses the estimate of losses if the number of beach trips remains unchanged, but recreators have a diminished experience as a result of plover-related restrictions.

4.3.1 Method One - Valuing Lost Beach Trips

158. The first method assumes that fewer people choose to visit plover beaches. The analysis assumes that pedestrians, equestrians, and people driving on the beach are affected. The types of losses measured include:

- **Welfare losses.** Due to implementation of partial beach closures, erection of exclosures or symbolic fencing, and activity restrictions (e.g., prohibitions against driving during plover breeding season) at certain beaches, users may have reduced or diminished recreational opportunities. Beach users will incur social welfare losses measured here as changes in consumer surplus. Consumer surplus losses are calculated by multiplying the number of foregone trips by the consumer surplus value of a beach use day.

- **Regional economic impacts.** Fewer beach-related trips will result in reductions in beach recreation-related expenditures in the local community. These reduced expenditures are likely to affect income and employment in various beach recreation-related industries. Impacts to these industries will, in turn, result in indirect effects on the broader economy.

159. Site-specific information on recreators' response to plover conservation efforts is not available. For example, crowding on beaches with significant amounts of symbolic fencing may cause recreators to go to an alternative, less preferred site or to forego the beach trip entirely. Because data on site or activity substitution behavior are not available, this method conservatively assumes that fewer users visit plover beaches during the breeding season.[118] The following steps are taken to estimate recreation losses:

- **Estimate baseline beach visitation.** To estimate the number of trips that would be taken to each potential critical habitat area absent plover conservation efforts, publicly available information was gathered on annual attendance at beaches with public access. Numerous sources provide data, including California State Parks, Oregon Parks and Recreation Department, Washington Department of Parks and

[118] A recently published study by Lew and Larson (2005) of 31 beaches in San Diego County estimates the mean per-trip lost value from the closure of a single beach in the choice set and suggests that the value of a lost trip when substitute sites are available ranges from $0.00 to $1.00. (Lew, Daniel K. and Douglas M. Larson, "Valuing Recreation and Amenities at San Diego County Beaches," *Coastal Management* 33:71-86, 2005.) Because data describing the population of beach-goers who potentially visit plover beaches and the grouping of beaches into choice sets, the mean per trip loss from this study cannot be applied in this analysis at this time. However, the results suggest that the availability of substitute sites can lower the per-trip loss by an order of magnitude. Therefore, beaches where less than ten percent of the linear extent of the beach is fenced are assumed to have sufficient substitute possibilities for beach-goers. Therefore, the loss at these sites is assumed to be zero.

Recreation, United States Lifesaving Association, Los Angeles County Beaches and Harbors, and Humboldt County Parks. Where data were not available for a beach area considered in this analysis, the closest similar site was identified and its attendance rate is used to calculate expected visitation. Most available attendance records are for periods before plover conservation efforts were implemented.

- **Forecast future visitation.** To fill in gaps in the historic visitation data and project future visitation, this analysis assumes that visitation rates are similar to the historic trend of State park visitation.[119] In California, beach visitation to each potential critical habitat area is assumed to increase by two percent annually.[120] In Oregon, beach visitation is assumed to increase 0.3 percent annually.[121] Beach visitation is assumed to increase 0.2 percent annually in Washington.[122]

- **Estimate foregone trips.** Ideally the number of foregone trips would be estimated by subtracting the actual number of trips taken after implementation of plover conservation efforts from projected baseline visitation. However, this information is not available. For the few sites where attendance information is available for the time period after the commencement of plover conservation efforts, data describing attendance prior to plover conservation efforts are lacking. In addition, attendance records for comparable plover and non-plover beaches that would allow for a comparison of attendance figures after the initiation of plover protections are unavailable.[123] This analysis, therefore, estimates the number of trips potentially foregone using information on linear miles of symbolic fencing and nest exclosures erected each season as well as information on driving restrictions.[124] The analysis assumes that annual visitors are distributed evenly along the entire length of publicly available beach. This analysis also assumes that 70 percent of beach visitation occurs during the plover nesting season, while the remaining 30 percent of beach

[119] This analysis investigated whether population change was an appropriate estimate of the expected change in recreation visitation. Population change was not found to be a reasonable predictor of beach visitation. The correlation between park and attendance and population was not found to be significant.

[120] This rate is based on Southwest Life Guard Visitation data for all California State Parks from 1967 to 2003. United States Lifesaving Association accessed at http://www.usla.org/Statistics/public.asp, on January 19, 2005.

[121] Oregon Park and Recreation Department, *Coastal State Park Day Use Attendance 1995-2003*.

[122] Washington State Parks and Recreation Commission, *Attendance at Washington State Parks 1992 to 2002*.

[123] Attendance records are available for Oceano Dunes State Vehicular Recreation Area from 1997 to 2004 where symbolic fencing began in 2001. Visitation to the area went down slightly in 2002 and 2003, but rose sharply in 2004. Changes in visitation may result from a variety of factors including weather, changes in access fees, water quality, changes in available services, changes in available substitutes, etc. Data for this site are inadequate to measure changes due to plover conservation efforts while controlling for these additional factors.

[124] Where information on the extent of nesting exclosures is unavailable, this analysis calculates linear miles by multiplying the number of nests in potential critical habitat by the length of an exclosure, discussed further in Section 4.4.1. Where information is unavailable on the extent of symbolic fencing, this analysis assumes the extent is equal to the potential critical habitat area where public access would have been allowed. Where information is unavailable on the extent of publicly accessible land in potential critical habitat, this analysis uses geographic information system (GIS) data on land ownership to estimate public access. This assumption is made for potential critical habitat areas CA-11C, CA-12A, and CA-15A.

visitation occurs during the wintering season.[125] The number of people participating in each type of recreation activity is derived from surveys of beach goers.

The annual number of foregone trips is calculated using the following equation:

Annual Trips Foregone = ((Attendance Per Mile during breeding season * Linear Miles of Plover Protection) x Percent Participation in Recreational Activity)

As discussed earlier, the analysis attempts to account for the possibility that certain beaches have numerous, on-site substitution options (e.g., the fencing is set in a remote area many miles from beach entrances or visitors are able to easily walk around the fencing) that significantly reduce the impact of plover restrictions. Specifically, the analysis assumes zero welfare loss at beaches where the linear extent of fencing is equal to less than ten percent of the total beach length. In addition, for the remaining potential critical habitat areas where losses are calculated, the estimate of foregone trips likely overstates the number of trips that are completely lost, because people may go to alternate beaches. As a result, estimated losses associated with foregone trips overstates the impact of plover conservation efforts on recreators.

4.3.2 Method Two - Diminished Beach Experience

160. The second method assumes that the number of people visiting each beach is unchanged as a result of plover conservation efforts, but that every person at the beach has a diminished experience. This approach is consistent with published economics research at a number of sites on the East Coast, and more recently, with the a study of beach visitation in San Diego County that estimate the reduction in welfare as attributes of a beach site change. None of the published studies specifically measure the reduction in welfare resulting from the erection of symbolic fencing or nest exclosures. However, the studies analyze other beach management policies that result in similar disamenities. For instance, McConnell found that beach congestion can negatively affect an individual's consumer surplus.[126] Others, including Parson et al., Shivlani et al., and von Haefen et al., have found that beach width (size) can also impact consumer surplus.[127]

161. In March 2005, Lew and Larson published the results of a recreation demand model explaining beach user's preferences in San Diego County. Because this study analyzed the preferences of California beach users, including beach users that may be

[125] Based on monthly visitation rates for beaches managed by California State Parks and Recreation with greater than ten plovers. Information provided by David Schaub, Manager National Heritage Section, California State Parks and Recreation, May 13, 2005.

[126] McConnell, Kenneth E., "Congestion and Willingness to Pay: A Study of Beach Use," *Land Economics* 53(2):185-195, 1977.

[127] Parsons, George R., D. Matthew Massey, and Ted Tomasi, "Familiar and Favorite Sites in a Random Utility Model of Beach Recreation," *Marine Resource Economics* 14:299-315, 2000. Shivlani, Manoj P., David Letson, and Melissa Theis, "Visitor Preferences for Public Beach Amenities and Beach Restoration in South Florida," *Coastal Management* 31:367-385, 2003. von Haefen, Roger H., Daniel J. Phaneuf, and George R. Parsons, "Estimation and Welfare Analysis With Large Demand Systems," *Journal of Business and Economic Statistics* 22(2):194-205, 2004.

affected by plover management efforts, it provides the best available data on the potential size of welfare losses associated with a disamenity. The beach attribute most closely related to fencing that was valued in the study is beach length. The authors found that the size of a beach affects the value of that site to users, and that generally, the value of the site increases as length increases.[128] Therefore, this second method assumes that the lost welfare experienced by pedestrians and equestrians as a result of fencing is proportional to the length of beach that is fenced. In addition, at beaches where no fencing occurs, but reduced mechanical beach raking is anticipated, visitor's trips may also be diminished. The value of these diminished trips is approximated using a study of the value of reduced marine debris in New Jersey and North Carolina.

162. The method followed to estimate losses associated with diminished trips follows these steps.

- **Estimate diminished trips.** The annual number of diminished trips is calculated using the following equations:

  Annual Trips Diminished by Fencing = (Attendance during breeding season at beaches containing critical habitat * Participation in Pedestrian and Equestrian Recreation)

  Annual Trips Diminished by Reduced Beach Raking = (Attendance Per Mile During the Wintering Season * Linear Miles of Reduced Beach Raking)

  As with Method 1, the analysis assumes zero welfare loss at beaches where the linear extent of fencing is equal to less than ten percent of the total beach length. The beach raking calculation may overstate the number of diminished trips, because reduced kelp removal may not be noticeable to all visitors. Conservation efforts for the plover include reducing mechanized beach raking from once a day to once a week below the wrack line.[129]

- **Value lost and diminished trips.** The value of foregone and diminished trips is obtained by reviewing the economics literature for studies of recreational activities at sites with similar attributes. This method is called benefits transfer; see Exhibit 4-7 for a detailed discussion.

- **Estimate welfare loss.** Welfare losses are calculated by multiplying the annual number of diminished trips by the appropriate per-trip value. Annual losses are then summed over the relevant time period (1993-2004 for past losses and 2005-2025 for future losses).

[128] Specifically, Lew and Larson found that "the coefficients on the length variables indicate utility increases with the length of beach at a decreasing rate." (Lew, Daniel K. and Douglas M. Larson, "Valuing Recreation and Amenities at San Diego County Beaches," *Coastal Management* 33:71-86, 2005.)

[129] Personal communication with U.S. Fish and Wildlife Service Biologist, February 16, 2005. Wrack is organic material cast on the shore, including seaweed and other vegetative and animal debris, excluding man-made material.

Exhibit 4-7

BENEFITS TRANSFER

Benefits transfer uses existing resource valuation estimates to calculate the value associated with an environmental change. That is, to estimate the value of a change in the human use of the environment (e.g., closure of a beach to driving) benefits transfer applies a value of that effect derived from existing empirical studies. Best practice in the conduct of benefits transfer generally involves five steps (U.S. Environmental Protection Agency (EPA) guidelines for preparing economic analyses describe these steps in more detail):

- **Describe conditions to be valued:** Identify and describe in detail the valuation scenario, which in this case involves the nature and extent of pedestrian, equestrian, and driving opportunities on the beaches within the potential critical habitat, the nature and extent of management restrictions present, and the manner in which the management restrictions have affected user behavior.
- **Identify relevant research**: Conduct a detailed search for relevant research.
- **Review research for quality and applicability**: Review relevant research carefully for quality and specific applicability.
- **Transfer of economic values**: Apply the valuation information identified to the conditions being valued; in this case, to estimate changes in welfare associated with restrictions on pedestrian, equestrian, and driving beach use within the potential critical habitat.
- **Address uncertainty**: Evaluate assumptions made in the process of transferring economic values and the sensitivity of final impact estimates to such assumptions.

Source: EPA, Guidelines for Preparing Economic Analyses, EPA-240-R-00-003, September 2000.

4.4 Method One - Welfare Losses Associated with Fewer Beach Trips

4.4.1 Pedestrian and Equestrian Restrictions

163. Pedestrian access is allowed at nearly all public beaches, while equestrian access is allowed at fewer beaches. Exhibit 4-6 lists the recreational activities allowed on public lands that contain potential critical habitat. Pedestrians may crush eggs or chicks, chase plovers off their nests, and cause plovers to abandon feeding areas. Horseback riders, in general, prefer to ride on the wet sand, as it is easier on the horse. However, riders sometimes enter the coastal dunes or upper beach areas, and may crush clutches or disturb plovers. To limit these impacts, symbolic fencing, nest exclosures, and signage may be erected or a portion of the beach may be closed to pedestrian and equestrian access.[130]

164. Site-specific data on the response of pedestrian and equestrian beach users who recreate on the beach are not available. This analysis draws upon existing valuation

[130] Unleashed dogs may chase plovers and destroy nests. Plovers may also be flushed from a nest if the dog is on a leash. In potential critical habitat, dogs may be required to be on a leash or be prohibited altogether. Dog restrictions may cause fewer or diminished trips by recreationists. However, there is currently no information available to estimate any losses associated with dog restrictions.

research performed in similar resource contexts and combines this information with site-specific data to develop an estimate of losses associated with plover pedestrian and equestrian restrictions. Specifically, this analysis estimates the number of general beach recreation trips potentially foregone as a result of plover conservation efforts, and applies a literature-based per-trip dollar value to estimate losses.

Number of Trips

165. As discussed in Section 4.3 the annual number of trips lost is calculated based on attendance per mile and linear miles of plover protection. Estimates of the linear miles of plover protection are based on information provided by beach managers and management plans. Where information on the extent of pedestrian and equestrian restrictions is not available, this analysis makes the following assumptions:

- **Symbolic fencing.** If symbolic fencing has been established or is likely to be established in the future this analysis assumes the extent is equal to the potential critical habitat area where pedestrian and/or equestrian access would have been allowed (i.e., areas not available to the public are excluded from the estimate). This estimate is based on a GIS analysis of available land ownership.

- **Nest Exclosures.** If nesting plovers have been found within a potential critical habitat area, this analysis assumes nest exclosures will be established starting in 2005. The linear extent of nest exclosures are calculated by multiplying the number of nests in a potential critical habitat area by the length of an exclosure. The number of nests is assumed to be one-half of the current nesting birds reported in the proposed critical habitat rule. Nest exclosures are assumed to be five to eight meters in diameter.[131]

- **Closures.** One partial closure is estimated in this analysis. Vandenberg Air Force base has implemented a closure on all but 1.5 miles of 11 miles of formerly publicly accessible beach (CA-17A and CA-17B).

California

166. Exhibits 4-4 and 4-5 provide a summary of the beaches that allow pedestrian and equestrian access. Exhibit 4-8 provides a list of the types of plover protection measures that may be implemented in each area; Section 3 of this report discusses the timeline for the implementation of these measures. Exhibit 4-9 shows the estimated annual general beach recreation trips lost in California potential critical habitat areas as a result of plover conservation efforts.

[131] California Department of Parks and Recreation, Natural Resources Division, *Western Snowy Plover Systemwide Management Guidelines*, 2002.

Exhibit 4-8

PLOVER PEDESTRIAN AND EQUESTRIAN RESTRICTIONS IN CALIFORNIA POTENTIAL CRITICAL HABITAT

Units Proposed for Designation	Plover Restriction
CA 3A. Clam Beach/Little Riv	Exclosures and symbolic fencing
CA 3B. Mad River	Exclosures and symbolic fencing
CA 4A. Humboldt Bay, S Spit	Exclosures and symbolic fencing
CA 4B. Eel Riv N Spit & Beach	Exclosures
CA 4C. Eel Riv S Spit & Beach	Symbolic fencing
CA 6. Manchester Beach	Exclosures and symbolic fencing
CA 8. Pt Reyes Beach	Symbolic fencing[a]
CA 10. Half Moon Bay	Exclosures and symbolic fencing
CA 11C. Wilder Cr. Beach	Exclosures and symbolic fencing
CA 12A. Jetty Rd to Aptos	Exclosures and symbolic fencing
CA 12C. Monterey to Moss Lnd	Symbolic fencing
CA 14. San Simeon Beach	Exclosures
CA 15A. Villa Cr Beach	Symbolic fencing
CA 15B. Atascadero Beach	Symbolic fencing
CA 15C. Morro Bay Beach	Symbolic fencing
CA 16. Pismo Beach/Nipomo	Exclosures and symbolic fencing
CA 17A. Vandenberg North	Closure
CA 17B. Vandenberg South	Closure
CA 18. Devereaux Beach	Symbolic fencing
CA 19A. Mandalay to Santa Clara	Exclosures and symbolic fencing
CA 19D. Mugu Lagoon S.	Exclosures
CA 24. San Onofre St Beach	Symbolic fencing
CA 25A. Batiquitos West	Exclosures
CA 27C. Silver Strand	Symbolic fencing

[a] Symbolic fencing is expected to increase from five to eight miles over the next 20 years as the plover population increases in this potential critical habitat area. It is possible that the full eight miles of symbolic fencing may not be realized in the 20-year timeframe. Personal communication with Service's Sacramento Field Office, June 16, 2005.
Source: California State Parks.

Exhibit 4-9

AVERAGE ANNUAL LOSS OF GENERAL BEACH RECREATION TRIPS IN POTENTIAL CRITICAL HABITAT IN CALIFORNIA

	Years of Impact	Average Annual Visits Per Mile During Breeding Season[a]	Linear Extent of Restrictions (Miles) [b]	Participation in Pedestrian or Equestrian Activities [c]	Average Annual Visits Lost[f]
Proposed for designation[e]					
CA 3A. Clam Beach/Little Riv	1999-2025	1,851	0.6	98%	1,075
CA 4A. Humboldt Bay, S Spit	2000-2025	21	0.5	98%	10
CA 12A. Jetty Rd to Aptos	2002-2025	57,267	2.5	100%	143,689
CA 12C. Monterey to Moss Lnd	1993-2025	299,090	1.9	100%	560,793
CA 15B. Atascadero Beach	2002-2025	43,917	1.7	100%	74,498
CA 15C. Morro Bay Beach	2002-2025	52,460	3.8	100%	197,931
CA 16. Pismo Beach/Nipomo	2002-2025	200,812	1.0	11%	142,577
CA 17A. Vandenberg North	2000-2025	35,092	2.0	100%	70,184
CA 17B. Vandenberg South	2000-2025	35,092	2.0	100%	70,184
CA 18. Devereaux Beach	2000-2025	22,410	0.5	100%	10,026
CA 27C. Silver Strand	2002-2025	67,531	2.0	100%	136,627

[a] Southwest Life Guard Visitation data for all California State Parks from 1967 to 2003. United States Lifesaving Association accessed at http://www.usla.org/Statistics/public.asp, on January 19, 2005; California State Parks. 2003. California Sate Park System Statistical Report 2001/02 Fiscal Year. Planning Division, California State Parks. Sacramento, California; Miner, Bill, Humboldt County Parks, written communication, February 16, 2005; Attendance Oceano Dunes District 1997 to 2004. Provided by Andrew Zilky, District Superintendent California State Parks. Personal communication, Ranger at MacKerricher State Beach.
[b] GIS analysis performed by IEc relying on information in the proposed rule, beach-specific management plans, and beach managers.
[c] Remaining participation after removing recreators whose principal activity is driving on the beach.
[d] Symbolic fencing is assumed to be equal to the area publicly available for recreation within the potential critical habitat.
[e] Includes only the units that are publicly managed and where the linear extent of fencing is greater than ten percent of the total beach length.
[f] Calculation using the data in the exhibit may vary slightly due to rounding.

167. Many comments were received during the public comment period for the proposed rule addressing the impact of plover conservation efforts on recreation use of Lawson's Landing Resort and Dillon Beach Resort within CA-7. The main concern was that the "proposed area would be either fenced off or closed completely and most likely all animals barred from the beach."[132] In addition, private property owners are concerned that requirements on future coastal development permits may include restrictions on recreational access.[133] A reduction in recreational access is not reasonably foreseeable, and therefore losses are not estimated at this site. In the past 11 years, plover conservation efforts in this wintering area have not affected the private property owners,

[132] Western Snowy Plover Petition organized by the Dillon Beach Resort Management and signed by over 300 people. The petition was submitted to the Service in the Petition to Exclude Limited Areas from the Proposed Critical Habitat Designation for the Western Snowy Plover (Dillon Beach); Joinder to Comments on Critical Habitat Designation, prepared by Tom Roth on behalf of Fred and Nancy Cline, Oxfoot Associates, LLC, Lawson's Landing Inc., and the Lawson family, February 15, 2005.

[133] Personal communication with Tom Roth, representative of Fred and Nancy Cline, Oxfoot Associates, LLC, Lawson's Landing Inc., and the Lawson family, March 18, 2005.

even though this unit was designated as critical habitat in 1999.[134] No projects are currently planned that would require a coastal development permit.[135]

168. The private property owners also assert that losses in income would result if the beach were closed. In 2004 more than 75,000 visitors drove to Dillon beach and paid a $5 daily use fee to use the private beach.[136] Another 25,000 walked or biked to Dillon Beach. Some of these visitors shopped at the Dillon Beach Resort Store. The beach-related fees and expenditures at the Dillon Beach Resort Store constitute more than 25 percent of the owners' income. At Lawson's Landing, between 30 and 50 percent of the annual income comes from beach visitation. If all visitation ceased, the loss in income would total $1.3 million. However, based on a review of historical impacts since the unit was designated as critical habitat in 1999, this analysis does not anticipate any impact to private property owners in CA-7 as a result of recreational access restrictions.

Oregon

169. In Oregon, pedestrians are allowed on most public beaches while equestrians are allowed on a smaller number of beaches. Exhibit 4-3 provides a summary of the beaches that allow pedestrian and equestrian access. Exhibit 4-10 provides a list of the types of plover protection measures that may be implemented in each area. Exhibit 4-11 shows the estimated annual general beach recreation trips lost in Oregon potential critical habitat areas as a result of plover conservation efforts.

[134] U.S. Fish and Wildlife Service, *Final Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover*, 64 FR 68507, December 7, 1999.

[135] Personal communication with Tom Roth, representative of Fred and Nancy Cline, Oxfoot Associates, LLC, Lawson's Landing Inc., and the Lawson family, March 18, 2005.

[136] Petition to Exclude Limited Areas from the Proposed Critical Habitat Designation for the Western Snowy Plover (Dillon Beach); Joinder to Comments on Critical Habitat Designation, prepared by Tom Roth on behalf of Fred and Nancy Cline, Oxfoot Associates, LLC, Lawson's Landing Inc., and the Lawson family, February 15, 2005.

Exhibit 4-10

PLOVER PEDESTRIAN AND EQUESTRIAN RESTRICTIONS IN OREGON POTENTIAL CRITICAL HABITAT

Area	Plover Restriction
Proposed for designation	
OR 3. Bayocean Spit	Symbolic fencing
OR 7. Sutton/Baker Beaches	Exclosures and symbolic fencing
OR 8A. Siltcoos River Spit	Exclosures and symbolic fencing
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	Exclosures
OR 8D. Tenmile Creek Spit	Exclosures and symbolic fencing
OR 9. Coos Bay N Spit	Exclosures
OR 10A. Bandon to Floras Lake	Exclosures and symbolic fencing
Areas identified for possible inclusion[a]	
OR 1A. Columbia River Spit	Symbolic fencing
OR 1B. Necanicum River Spit	Symbolic fencing
OR 2. Nehalem River Spit	Symbolic fencing
OR 4. Netarts Spit	Symbolic fencing
OR 5B. Sand Lake South	Symbolic fencing
OR 8C. N Umpqua River Spit	Symbolic fencing
OR 10C. Elk River Spit	Symbolic fencing
OR 11. Euchre Creek Spit	Symbolic fencing
OR 12. Pistol River Spit	Symbolic fencing

[a] Symbolic fencing is expected to be constructed at various times over the next 20 years consistent with the Draft HCP. For a more complete discussion of implementation see Section 3.
Source: Oregon Parks and Recreation Department, Draft Habitat Conservation Plan for the Western Snowy Plover, 2004.

Exhibit 4-11

AVERAGE ANNUAL LOSS OF GENERAL BEACH RECREATION TRIPS IN POTENTIAL CRITICAL HABITAT IN OREGON

Area	Years of Impact	Average Annual Visits Per Mile [a]	Linear Extent of Restrictions (Mile) [b]	Participation [a]	Average Annual Visits Lost
Proposed for designation [c]					
OR 8D. Tenmile Creek Spit	1995-2025	125	1.0	100%	118
OR 10A. Bandon to Floras Lake	1997-2025	79	2.4	100%	186
Areas identified for possible inclusion [c]					
OR 1A. Columbia River Spit	2006-2025	8	1.8	100%	13
OR 2. Nehalem River Spit	2006-2025	163	3.1	100%	500
OR 5B. Sand Lake South	2011-2025	106	2.8	100%	298
OR 8C. N Umpqua River Spit	2016-2025	37	2.9	61%	64
OR 10C. Elk River Spit	2016-2025	3	2.3	75%	5
OR 12. Pistol River Spit	2021-2025	167	1.8	100%	306

[a] For Oregon, detailed information on the number of people visiting each beach and their location on the beach was recorded using Global Positioning System (GPS). For this method, the analysis uses visitation data per mile that is specific to the potential critical habitat areas. (Shelby, Bo and John Tokarczyk, *Oregon Shores Recreational Use Study*, prepared for Oregon Parks and Recreation Department, 2002.)
[b] GIS analysis performed by IEc.
[c] Includes only the publicly-accessible units where the linear extent of fencing is greater than ten percent of the total beach length. Units OR3 – Bayocean Spit and OR4 – Netarts Spit are not included, because GPS survey data obtained from Bo Shelby indicate that none of the visitors to these beaches enter the proposed critical habitat area.

Washington

170. In the potential critical habitat areas in Washington, public pedestrian access is allowed. The three potential critical habitat areas could have exclosures (WA-2, WA-3, and WA-4); plover management at area WA-1 is unlikely, because no plover use has been documented since 1984.[137] These potential nest exclosures are expected to impact less than ten percent of the linear extent of each beach within potential critical habitat, therefore, this analysis does not estimate losses associated with plover fencing in Washington.

Value Per Trip

171. To identify an appropriate per-trip value for a general beach recreation trip to potential critical habitat areas in California, Oregon, and Washington, the economics literature was reviewed for valuation studies addressing sites with similar attributes. This analysis assumes that under plover pedestrian and equestrian restrictions, recreators forego participation in these activities. As such, the surplus estimates used in this analysis reflect the total value of a day spent recreating at the beach. Data do not exist to model changes in visitor behavior when faced with the plover conservation efforts. For

[137] U.S. Fish and Wildlife Service, *Proposed Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004.

example, given closure of one area, users might simply substitute to other areas outside of potential critical habitat, or to another location in the region. However, such changes in behavior might involve a loss in surplus to the user (associated with a change away from their preferred location), and a loss in surplus to other users due to congestion. Given the absence of detailed data for these sites, this method overstates welfare losses.

172. This analysis relies on a study by Lew and Larson to estimate general beach recreation values.[138] Their research provides a sound foundation on which to build a simple benefits transfer analysis. The study uses a random utility travel cost model to estimate the value of a beach day for San Diego County residents. The model includes several beaches in its choice set that are the focus of this analysis. The results are based on 494 telephone-mail-telephone survey respondents contacted in 2000 and 2001. The approach represents the current state-of-the-art in recreational demand analysis, and the study was published in the peer-reviewed journal *Coastal Management.* The study reports consumer surplus values per person of $30 per day (2004$).[139] Exhibit 4-12 summarizes key characteristics of the Lew and Larson study related to critical habitat beach activity.

Exhibit 4-12

KEY CHARACTERISTICS OF LEW AND LARSON STUDY OF BEACH RECREATION

Characteristic	Lew and Larson (2005)
Location	San Diego Beaches including San Onofre State-Camp Pendleton Beaches, South Carlsbad State Beach, Torrey Pines State Beach, Silver Strand State Beach, and Border Field State Beach.
Population sampled	494 households in San Diego County
Valuation methodology	Travel Cost
Resource valued	General beach recreation
Year of survey	2001
Average visits per year	12
Per-person consumer surplus per day ($2004)	$30

Source: Lew, Daniel K. and Douglas M. Larson, "Valuing Recreation and Amenities at San Diego County Beaches," *Coastal Management* 33:71-86, 2005.

Welfare Loss Estimates

173. To estimate aggregate pedestrian and equestrian restriction losses on an annual basis, the valuation information on a general beach day is combined with estimates of trips foregone. Losses are calculated by multiplying the annual estimated number of foregone trips by the per-day value ($30) from Lew and Larson (2005). Annual losses are then summed over the relevant time period. Exhibit 4-13 presents the past and future general beach recreation losses by potential critical habitat area. Past losses are

[138] Lew, Daniel K. and Douglas M. Larson, "Valuing Recreation and Amenities at San Diego County Beaches," *Coastal Management* 33:71-86, 2005.

[139] Lew and Larson do not report the average length of a beach trip, but use the terms “day” and “trip” interchangeably.

calculated from 1993 through 2004 while future losses are calculated from 2005 to 2025. The total value of past losses for units proposed for designation is approximately $232 million (unadjusted dollars). Applying discount rates of three and seven percent yields present value past losses of $271 million and $332 million, respectively. No past costs are anticipated for areas identified for possible inclusion or proposed for exclusion.

174. The total present value of future losses in units proposed for designation is approximately $989 million (unadjusted dollars). Future costs are $732 million if a three percent discount rate is applied and $520 million if a seven percent discount rate is applied. Future costs in areas identified for possible inclusion less than $1 million (unadjusted dollars).

Exhibit 4-13

ESTIMATED PAST AND FUTURE LOSSES WITHIN POTENTIAL CRITICAL HABITAT AREAS ASSOCIATED WITH PEDESTRIAN AND EQUESTRIAN RESTRICTIONS

Unit	Average Annual Lost Trips	Average Annual Value	1993-2004			2005-2025		
			Constant Dollars	Present Value 3%	Present Value 7%	Constant Dollars	Present Value 3%	Present Value 7%
Proposed for designation								
OR 8D. Tenmile Creek Spit	118	$3,555	$34,000	$41,000	$51,000	$76,000	$57,000	$42,000
OR 10A. Bandon to Floras Lake	186	$5,599	$43,000	$50,000	$60,000	$120,000	$90,000	$66,000
CA 3A. Clam Beach/Little Riv	1,075	$32,409	$10,000	$10,000	$11,000	$700,000	$518,000	$368,000
CA 4A. Humboldt Bay, S Spit	10	$313	$0	$0	$0	$7,000	$5,000	$4,000
CA 12A. Jetty Rd to Aptos	143,689	$4,332,748	$11,539,000	$12,257,000	$13,260,000	$90,956,000	$67,313,000	$47,858,000
CA 12C. Monterey to Moss Lnd	560,793	$16,909,930	$162,179,000	$196,165,000	$254,550,000	$395,848,000	$292,952,000	$208,284,000
CA 15B. Atascadero Beach	74,498	$2,246,368	$4,749,000	$5,009,000	$5,369,000	$59,054,000	$43,704,000	$31,073,000
CA 15C. Morro Bay Beach	197,931	$5,968,330	$15,848,000	$16,815,000	$18,165,000	$138,047,000	$102,163,000	$72,636,000
CA 16. Pismo Beach/Nipomo	142,577	$4,299,201	$7,528,000	$7,858,000	$8,308,000	$109,248,000	$80,850,000	$57,483,000
CA 17A. Vandenberg North	70,184	$2,116,311	$8,625,000	$9,342,000	$8,579,000	$52,917,000	$39,162,000	$27,844,000
CA 17B. Vandenberg South	70,184	$2,116,311	$8,625,000	$9,342,000	$8,579,000	$52,917,000	$39,162,000	$27,844,000
CA 18. Devereaux Beach	10,026	$302,317	$1,294,000	$1,413,000	$1,588,000	$7,076,000	$5,237,000	$3,723,000
CA 27C. Silver Strand	136,627	$4,119,793	$11,532,000	$12,275,000	$13,314,000	$82,100,000	$60,759,000	$43,199,000
Total Proposed Units	1,407,898	$42,453,186	$232,006,000	$270,577,000	$331,834,000	$989,066,000	$731,972,000	$520,424,000
Areas identified for possible inclusion								
OR 1A. Columbia River Spit	13	$403	$0	$0	$0	$8,000	$6,000	$4,000
OR 2. Nehalem River Spit	500	$15,066	$0	$0	$0	$578,000	$429,000	$304,000
OR 5B. Sand Lake South	298	$8,994	$0	$0	$0	$376,000	$258,000	$162,000
OR 8C. N Umpqua River Spit	64	$1,929	$0	$0	$0	$40,000	$25,000	$14,000
OR 10C. Elk River Spit	5	$158	$0	$0	$0	$3,000	$2,000	$1,000
OR 12. Pistol River Spit	306	$9,238	$0	$0	$0	$0	$0	$0
Total Possible Units	1,187	$35,788	$0	$0	$0	$1,005,000	$720,000	$485,000

Note: Totals may not sum due to rounding.

4.4.2 Motorized Vehicle Restrictions

175. In limited areas, recreators are permitted to drive street legal vehicles, OHVs, and/or ATVs on the beach.[140] Exhibits 4-3 through 4-6 show public lands that contain potential critical habitat and allow vehicle use. Driving on the beach may be the primary recreational activity or may provide access to the primary recreational activity (e.g., surfing, fishing, beach combing, or driftwood collection). Driving in plover habitat may crush eggs, chicks, and adults, cause abandonment of nests, destroy dune vegetation, and provide access to otherwise remote areas. Plover protection efforts may include symbolic fencing, nest exclosures, the placement of signage asking visitors to avoid plover nests, or beach closures.

176. Plover conservation efforts may reduce the number of driving trips taken to the beaches within the potential critical habitat. Site-specific data on the response of beach users who drive street legal vehicles, OHVs, and ATVs on the beach are not available. This analysis draws upon existing valuation research performed in similar resource contexts and combines this information with site-specific data to estimate losses associated with vehicle driving restrictions. Specifically, this analysis estimates the number of driving trips foregone due to plover conservation efforts, and applies a literature-based per-trip dollar value to estimate losses. It is possible that recreators experience diminished trips rather than forgo trips altogether; however, information is not available to estimate these losses. By assuming recreators forgo beach driving trips this analysis overstates the impact to beach driving due to plover conservation efforts.

<u>Number of Trips</u>

177. Plover conservation efforts are expected to affect beach-driving recreation. Protection efforts such as symbolic fencing, nest exclosures, the placement of signage, and beach closures may reduce the number of beach driving trips taken to potential critical habitat areas. California, Oregon, and Washington have different rules for driving on the beach, therefore, this analysis estimates the number of trips lost by State.

California

178. For beaches managed by the State of California, motorized vehicles can only legally access the beach in one State park, the ODSVRA (CA-16). In addition, Federal

[140] In Oregon an ATV is the term used to describe all OHVs. An ATV is any Class I, II, or III vehicle that is designed for and capable of cross-county travel over land or other natural terrain and is actually being operated off-highway. The California Department of Motor Vehicles defines OHVs as vehicles such as racing motorcycles, trail bikes, mini bikes, dune buggies, all-terrain vehicles, and snowmobiles which are operated exclusively off public roads and highways. In Washington an ATV is defined as any self-propelled vehicle other than a snowmobile, capable of cross-country travel on or immediately over land, water, snow, ice, marsh, swampland, and other natural terrain, including, but not limited to, four-wheel vehicles, amphibious vehicles, ground effect or air cushion vehicles, and any other means of land transportation deriving motive power from any source other than muscle or wind (except any vehicle designed primarily for travel on, over, or in the water, farm vehicles, or any military or law enforcement vehicles). Street legal vehicles are those vehicles licensed to operate on public roads.

and local managers of beaches within the State also allow access in a few areas. The extent of vehicle access in California and potential plover restrictions is presented in Exhibit 4-14. Exhibit 4-15 shows the estimated annual beach driving trips lost in California potential critical habitat areas as a result of plover conservation efforts.

Exhibit 4-14

VEHICLE BEACH ACCESS AND PLOVER RESTRICTION IN POTENTIAL CRITICAL HABITAT IN CALIFORNIA

Unit	Vehicle Access	Plover Restrictions
CA 3A. Clam Beach Little Riv	Street licensed four-wheeled drive vehicles are allowed on the waveslope on Clam Beach County Park. [a]	A closure of Clam Beach County Park to vehicles is recommended by the Clam and Moonstone Beach County Parks Management Master Plan.[a]
CA 3B. Mad River	Street licensed four-wheeled drive vehicles are allowed on the waveslope on Clam Beach County Park. [a]	A closure of Clam Beach County Park to vehicles is recommended by the Clam and Moonstone Beach County Parks Management Master Plan. [a]
CA 4A. Humboldt Bay S Spit	Street licensed vehicles allowed on the waveslope at BLM managed Humboldt Bay South Spit. [b]	During the nesting season vehicles are not allowed on a half-mile segment. [b]
CA 16. Pismo Beach/Nipomo	Street licensed vehicle access allowed on five miles of beach. OHV access allowed on 3.5 miles of beach. [c]	During the nesting season one linear mile of nest exclosures is erected. [c]

[a] Humboldt County Department of Public Works. Clam and Moonstone Beach County Parks Management Master Plan. Prepared by The Planwest Partners Team. March 2004.
[b] Personal communication Linda Roush, Bureau of Land Management Arcata Field Office, March 30, 2005.
[c] California State Parks. Second Administrative Draft Habitat Conservation Plan for The California Department of Parks and Recreation San Luis Obispo Coast District and Oceano Dunes State Vehicular Recreation Area. Prepared by Thomas Reid Associates in association with California Sate University, Monterey Bay. April 12, 2004.

Exhibit 4-15

AVERAGE ANNUAL LOSS OF VEHICLE BEACH USE TRIPS IN POTENTIAL CRITICAL HABITAT IN CALIFORNIA

Unit	Years of Impact	Average Annual Visitors Per Mile	Restriction (Miles)	Participation in Beach Driving	Average Annual Lost Trips
CA 3A. Clam Beach Little Riv	2003-2025	2,671 [a]	0.8 [d]	1.6% [f]	34
CA 3B. Mad River	2003-2025	1,500 [a,b]	1.3 [d]	1.6% [f]	31
CA 4A. Humboldt Bay S Spit	2003-2025	23 [a]	0.5 [d]	1.6% [f]	<1
CA 16. Pismo Beach/Nipomo	2001-2025	229,613 [c]	1 [e]	29% [f]	66,588

[a] California State Parks. 2003. California Sate Park System Statistical Report 2001/02 Fiscal Year. Planning Division, California State Parks. Sacramento, California.
[b] Written communication, Bill Miner, Humboldt County Parks, February 16, 2005.
[c] Attendance Oceano Dunes District 1997 to 2004. Provided by Andrew Zilky, District Superintendent California State Parks.
[d] GIS analysis of land ownership performed by IEc. This analysis assumes the extent of restrictions is equal to the potential critical habitat area where driving would have been allowed (i.e., areas not available to the public for driving are excluded from the estimation).
[e] California State Parks. Second Administrative Draft Habitat Conservation Plan for The California Department of Parks and Recreation San Luis Obispo Coast District and Oceano Dunes State Vehicular Recreation Area. Prepared by Thomas Reid Associates in association with California Sate University, Monterey Bay. April 12, 2004.
[f] Actual beach driving participation is unavailable for these units. This analysis assumes participation is equal to participation by Oregon resident as estimated in Shelby and Tokarczyk (2002).
[g] California Department of Parks and Recreation. News Release California Coastal Commission to Consider Visitor Use at Oceano Dunes State Vehicular Recreation Area. January 31, 2001.

Oregon

179. In Oregon, street legal vehicles are allowed on the beach in select areas, and ATVs are allowed on the beach at Oregon Dunes National Recreation Area (OR-8A, OR-8B, OR-8C, OR-8D) and Sand Lake (OR-5A). Portions of the Oregon Dunes National Vehicular Recreation Area are closed to motorized activities during the breeding season. Areas with historic beach access for street legal vehicles have been restricted to protect the plover, and the draft OPRD HCP recommends additional restrictions in occupied plover areas (see Section 3 for a more complete discussion of the OPRD HCP). Exhibit 4-16 characterizes the extent of vehicle access in Oregon and potential plover restrictions. Exhibit 4-17 shows the estimated annual beach driving trips lost in Oregon potential critical habitat areas as a result of plover conservation efforts.

Exhibit 4-16

VEHICLE BEACH ACCESS AND PLOVER RESTRICTION IN POTENTIAL CRITICAL HABITAT IN OREGON

Unit	Vehicle Access	Plover Restrictions
OR 1A. Columbia River Spit	Driving any vehicle on dry sand is against park (Fort Stevens State Park) rules. [a]	The motor vehicle access point from the road will be closed at least during the nesting season if plovers nest here. [a]
OR 5A. Sand Lake North	Open to OHV driving October 1 to April 30 (weekdays). [a]	None. [a]
OR 5B. Sand Lake South	Open to street legal vehicle driving October 1 to April 30 (weekdays). [a]	None. [a]
OR 6. Nestucca River Spit	Open to ATV driving year-round. [a]	None. [a]
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	Portions of this unit closed to vehicle driving year round. [b]	Closed prior to plover. [b]
OR 8C. N Umpqua River Spit	Open to street legal vehicle driving year round. [a]	Closure for plover. [a]
OR 8D. Tenmile Creek Spit	Closed to driving. [b]	Closure for plover.
OR 9. Coos Bay N Spit	Five miles closed to driving year round. [c]	Plover reduces surfing access. [c]
OR 10A. Bandon to Floras Lake	Driving street legal vehicles on a small portion of the beach is allowed year round, seasonal restrictions currently in place. [a]	Sections of beach currently open to driving will be closed year round. [a]
OR 10C. Elk River Spit	Open to street legal vehicles year round. [a]	Closure for plover. [a]

[a] Oregon Parks and Recreation Department, Draft Habitat Conservation Plan for the Western Snowy Plover, 2004.
[b] Personal communication with Carl Frounfelker, US Forest Service Siuslaw National Forest, December 6, 2004.
[c] Personal communication with Kerrie Palermo, Bureau of Land Management, December 7, 2004

Exhibit 4-17

VEHICLE BEACH ACCESS AND PLOVER RESTRICTION IN POTENTIAL CRITICAL HABITAT IN OREGON

Unit	Years of Impact	Average Annual Visitors Per Mile [a]	Restriction (Miles)	Participation in Beach Driving [a]	Average Annual Lost Trips
OR 8C. N Umpqua River Spit	2016-2025	38	2.87	39%	43
OR 8D. Tenmile Creek Spit	1995-2025	125	4.2	7%	37
OR 9. Coos Bay N Spit	1999-2025	22	5 [b]	2.1%	2
OR 10A. Bandon to Floras Lake	2005-2025	81	0.95 [c]	7%	5
OR 10C. Elk River Spit	2016-2025	3	2.29	25%	2

[a] Shelby, Bo and John Tokarczyk, *Oregon Shores Recreational Use Study*, prepared for Oregon Parks and Recreation Department, 2002.
[b] Personal communication with Kerrie Palermo, Bureau of Land Management, December 7, 2004.
[c] GIS analysis performed by IEc using information provided by land managers.

Washington

180. In Washington driving on the hard sand portion of the beach is legal on beaches designated as a State highway.[141] Driving occurs in Griffith Priday State Park (WA-1) and on Midway Beach (WA-3). There have been no restrictions on driving on these beaches historically, and efforts in the future will include enforcing the dry sand driving prohibition.[142] Therefore, no surplus losses are calculated for Washington.

Value Per Trip

181. To identify an appropriate per-trip value for beach driving trip in potential critical habitat in California and Oregon, the economics literature was reviewed for valuation studies of sites with similar attributes. This analysis assumes that under plover-related driving restrictions, recreators forego participation in this activity or the activities facilitated by driving (i.e., surfing and fishing). As such, the surplus estimates used in this analysis reflect the total value of a day of beach driving recreation or recreation activities facilitated by beach driving.

182. Few studies in the economics literature estimate welfare values associated with recreational driving, and none of these studies analyze beach driving. However, consumer surplus associated with OHV use at interior sites is likely similar to that for beach sites. In both cases, visitors likely represent a mix of local residents taking day trips and non-residents traveling long distances for a multi-day excursion. In addition, the primary recreational activity of the trips to both types of sites is driving over challenging topography in largely unpopulated areas of sand dunes or hilly terrain.

183. Two studies providing welfare estimates at interior sites are used in this analysis. First, Englin et al. is a travel cost study that estimates the welfare value of OHV use at four recreational sites in western North Carolina.[143] This study provides per person OHV values that vary with the recreational site ranging from approximately $28 per trip to $135 per trip (2004$). The results are based on nearly 700 intercept interviews conducted between 1997 and 1999 at the recreation sites. The authors appear to follow general best practices in the calculation of travel costs underlying these estimates.

184. Second, Jakus estimates welfare values for OHV use in the State of Utah using a random utility travel cost model.[144] This approach represents current state-of-the art in recreational demand analysis. This study reports that consumer surplus values per person range from approximately $52 per day to $60 per day (2004$).[145] The results are based on over 300 telephone interviews, with an effective response rate of 68 percent. Exhibit

[141] Personal communication with Lisa Lantz, Washington State Parks and Recreation, January 5, 2005.

[142] Ibid.

[143] Englin, Jeffrey, Thomas Holmes, and Rebecca Niell, *Alternative Systems of Semi-logarithmic Incomplete Demand Equations: Modeling Recreational Off-Highway Vehicle Site Demand*, Western Regional Research Publication, 2003.

[144] Jakus, Paul, *Estimating the Economic Value of All-Terrain Vehicle Recreation in Utah*, Department of Economics, Utah State University, September, 2003.

[145] Consumer Price Index used to convert to 2004 dollars.

4-18 provides a comparison of the site characteristics of the beach driving valuation literature to beaches potentially affected by plover conservation efforts.

Exhibit 4-18

COMPARISON OF BEACH RECREATION LITERATURE SITE CHARACTERISTICS AND POTENTIAL PLOVER CRITICAL HABITAT BEACH USERS

Characteristic	Jakus (2003)	Englin et al. (2003)
Location	100 distinct sites in Utah.	Four recreational OHV sites in western North Carolina. These sites include Badin Lake, Brown Mountain, Upper Tellico, and Wayehutta OHV recreation areas.
Valuation methodology	Travel cost	Travel Cost
Resource valued	ATV recreation	ATV, four-wheel drive vehicle, and trail bike recreation
Population sampled	OHV owners in Utah	OHV visitors
Year of survey	2000	2000
Average visits per year	14 visits per year	6 visits per year
Trip Length	1 day	1 ½ to 2 days per trip
Vehicle type	ATV	ATV, four-wheel drive vehicle, and trail bike
Per-person consumer surplus per day (2004$)	$52 - $60	$14 - $90

Sources: Englin, Jeffrey, Thomas Holmes, and Rebecca Niell, *Alternative Systems of Semi-logarithmic Incomplete Demand Equations: Modeling Recreational Off-Highway Vehicle Site Demand*, Western Regional Research Publication, 2003; Jakus, Paul, *Estimating the Economic Value of All-Terrain Vehicle Recreation in Utah*, Department of Economics, Utah State University. September, 2003.

185. In addition, at certain beaches where motorized vehicles are allowed, beach driving facilitates another activity that is the primary purpose of the trip. For example, at CA-4A, Humboldt Bay South Spit, pleasure driving is not allowed but driving provides access to fishing areas. At OR-8C and OR-10C driving facilitates fishing from the beach. At OR-9, Coos Bay North Spit, surfers drive up and down the beach to locate the best surf breaks. This analysis uses separate welfare values for areas where driving facilitates other activities.

186. No relevant studies in the economics literature provide estimates for surfing values. However, Hanemann estimated the consumer surplus for this activity in Orange County, California when estimating the recreational damages resulting from the American Trader Oil Spill.[146] Consumer surplus of surfing was estimated to likely be at least 25 percent greater than the consumer's surplus for general beach recreation. As noted, the value of a general beach recreation day is estimated to be approximately $30. Therefore, the value of a surfing day is estimated to be approximately $38 (2004$).

187. This analysis relies on a single study from the economic valuation literature estimating surf fishing values. Wegge et al. use a travel cost model to estimate welfare

[146] Hanemann, Michael, Final Conclusions of Professor Michael Hanemann Regarding Lost Recreational Damages Resulting from the American Trader Oil Spill, August 15, 1997.

values for shore fishing on the southern California coast.[147] This study reports a consumer surplus value per person of $118 per day (2004$).[148] The results are based on mail surveys of roughly 1,400 households, with an approximate 47 percent response rate. Exhibit 4-19 summarizes key characteristics of the Wegge et al. study.

Exhibit 4-19

COMPARISON OF BEACH RECREATION LITERATURE SITE CHARACTERISTICS AND POTENTIAL PLOVER CRITICAL HABITAT BEACH USERS

Characteristic	**Wegge et al. (1986)** **Potential Critical Habitat User**
Location	Southern California
Valuation Methodology	Travel Cost
Resource Valued	Shore fishing without a boat for croaker, Pacific mackerel, and surf perch.
Population sampled	South Coast Sport Fishing subscribers
Year of survey	1984
Average days per trip	2,514 trips ≤ 1 day 796 trips > 1 day
Per-person consumer surplus per fishing day (2004$)	$118

Sources: Wegge, Thomas, Michael Hanemann, and Ivar Strand, *An Economic Assessment of Marine Recreational Fishing in Southern California*, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, 1986.

188. Exhibit 4-20 summarizes the beach driving and other driving-related recreation valuation literature discussed in this section.

[147] Wegge, Thomas, Michael Hanemann, and Ivar Strand, *An Economic Assessment of Marine Recreational Fishing in Southern California*, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, 1986.

[148] This analysis assumes a trip is one day in length. This assumption may overstate impacts.

Exhibit 4-20

SUMMARY OF RECREATIONAL BEACH DRIVING VALUATION LITERATURE PER DAY VALUES

Authors	Study Location	Characteristics	Value Estimate (2004$)
Englin et al. (2003)[a]	North Carolina	ATV, Four-Wheel Drive, and Trail Bike Recreation	$14
			$90
Jakus (2003)	Utah	ATV Recreation	$52
			$60
Driving Day Average			**$54**
Hanemann (1997)	California	Surfing	$38
Surfing Day Average			**$38**
Wegge et al. (1986)[b]	Southern California	Shore fishing	$118
Surf Fishing Day Average[a]			**$118**

Sources: Englin, Jeffrey, Thomas Holmes, and Rebecca Neill, *Alternative Systems of Semi-logarithmic Incomplete Demand Equations: Modeling Recreational Off-Highway Vehicle Site Demand*, Western Regional Research Publication, 2003; Jakus, Paul, *Estimating the Economic Value of All-Terrain Vehicle Recreation in Utah*, Department of Economics, Utah State University. September 2003; Hanemann, Michael, *Final Conclusions of Professor Michael Hanemann Regarding Lost Recreational Damages Resulting from the American Trader Oil Spill*, August 15, 1997; Wegge, Thomas, Michael Hanemann, and Ivar Strand, *An Economic Assessment of Marine Recreational Fishing in Southern California*, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, 1986.

Notes:
[a] Per trip values converted to per day values based on information provided in the study about the average length of a trip.
[b] This analysis assumes a trip is one day in length. This assumption may overstate impacts.

Loss Estimation

189. To estimate aggregate beach driving losses on an annual basis, the valuation information on a beach driving day is combined with estimates of trips foregone. Foregone trip losses are calculated by multiplying the annual estimated number of trips that would have been taken without plover conservation efforts by the per-day value for beach driving ($54), surfing ($38), and surf fishing ($118) (2004$). This assumes that all trips are lost and not substituted elsewhere. Annual losses are then summed over the relevant time period. Past losses are calculated from 1993 through 2004. Future losses are calculated from 2005 to 2025.

190. Exhibit 4-21 summarizes the estimated losses by potential critical habitat area. The total present value of past losses is approximately $10 million (2004$) in constant dollars. Discounting past costs by rates of three and seven percent yields estimates of $10.7 million and $11.8 million. The total present value of future losses for proposed critical habitat is approximately $80.2 million (2004$), with estimates of $59.3 million and $42.2 million obtained with discount rates of three and seven percent (respectively). Most of these costs are associated with proposed units, with a small portion attributable to possible units; no costs are anticipated for areas proposed for exclusion.

Exhibit 4-21

ESTIMATED PAST AND FUTURE BEACH DRIVING LOSSES WITHIN POTENTIAL CRITICAL HABITAT AREAS

Unit	Average Annual Lost Trips	Average Annual Lost Value	Constant Dollars	Present Value 1993-2004		Constant Dollars	Present Value 2005-2025	
				3%	7%		3%	7%
Proposed for designation								
OR 8D. Tenmile Creek Spit [a]	37	$2,000	$19,000	$23,000	$28,000	$42,000	$32,000	$23,000
OR 9. Coos Bay N Spit [c]	2	<$1,000	<$1,000	$1,000	$1,000	$2,000	$1,000	$1,000
OR 10A. Bandon to Floras Lake [a]	5	<$1,000	<$1,000	<$1,000	<$1,000	$6,000	$5,000	$3,000
CA 3A. Clam Beach Little Riv [a]	34	$2,000	$3,000	$3,000	$3,000	$40,000	$29,000	$21,000
CA 3B. Mad River [a]	31	$2,000	$3,000	$3,000	$3,000	$36,000	$27,000	$19,000
CA 4A. Humboldt Bay S Spit [b]	<1	<$1,000	<$1,000	<$1,000	<$1,000	<$1,000	<$1,000	<$1,000
CA 16. Pismo Beach/Nipomo [a]	66,588	$3,601,000	$9,996,000	$10,723,000	$11,758,000	$80,027,000	$59,225,000	$42,108,000
Total Proposed Units [d]			**$10,021,000**	**$10,753,000**	**$11,793,000**	**$80,153,000**	**$59,319,000**	**$42,175,000**
Areas identified for possible inclusion								
OR 8C. N Umpqua River Spit [b]	43	$5,000	<$1,000	<$1,000	<$1,000	$50,000	$32,000	$18,000
OR 10C. Elk River Spit [b]	2	<$1,000	<$1,000	<$1,000	<$1,000	$2,000	$1,000	$1,000
Total Possible Units[d]			**$0**	**$0**	**$0**	**$52,000**	**$33,000**	**$19,000**

Notes:
[a] Pleasure driving is allowed at these beaches; therefore, this analysis assumes beach driving trips are lost.
[b] Pleasure driving is not allowed at this beach; therefore, this analysis assumes surf fishing trips, one of the most popular activities at this site, are lost.
[c] The same amount of pleasure driving area is available as before plover management was undertaken. However, access to the surfing area has been reduced by the driving restriction. Therefore, this analysis assumes surfing trips are lost.
[d] Totals may not sum due to rounding.

4.5 Method Two - Welfare Losses Associated With Diminished Beach Trips

4.5.1 Pedestrian and Equestrian Restrictions

191. As described previously in Section 4.4, pedestrians and equestrians pose a threat to plovers and their habitat. This second method for estimating impacts treats plover conservation efforts (e.g., fencing) as a disamenity that affects beach users' trips to plover beaches. This analysis assumes that no trips are lost; however, every beach user has a diminished experience. The value lost as a result of this disamenity is estimated by applying a literature-based per-trip dollar value to the each trip taken to affected beaches.

Number of Trips

192. The total number of trips taken to beaches experiencing plover protection efforts are estimated relying on the same data sources used in Section 4.4. However, unlike Section 4.4, which assumed that a number of visitors affected is proportional to the linear extent of fencing experience a loss, this method assumes a larger population is affected. Because the plover protections are treated as a disamenity, every visitor at a beach with critical habitat where symbolic fencing or exclosures are erected experiences a loss. This assumption is consistent with the published economics literature on valuing disamenity effects at beaches. Again, the analysis assumes that 70 percent of annual attendance occurs during plover breeding season when restrictions are in place.

California

193. For the beaches assumed to have symbolic fencing or exclosures in California, Exhibit 4-22 provides estimates of the average annual number of pedestrian or equestrian trips taken during plover breeding season. The number of estimated visitors affected under this method is three times greater than the number estimated under the first method.

Oregon

194. For beaches assumed to have symbolic fencing or exclosures in Oregon, Exhibit 4-23 provides estimates of the average annual number of equestrian or pedestrian trips taken during plover breeding season. The number of estimated visitors affected under this method is much greater than the number estimated under the first method.

Exhibit 4-22

AVERAGE ANNUAL LOSS OF GENERAL BEACH RECREATION TRIPS IN POTENTIAL CRITICAL HABITAT IN CALIFORNIA

Unit	Years of Impact	Average Annual Visitors With a Diminished Experience	Participation in Pedestrian and Equestrian Activities	Average Annual Diminished Trips
Proposed for designation				
CA 3A. Clam Beach/Little Riv	1999-2025	3,266	98%	3,213
CA 4A. Humboldt Bay, S Spit	2003-2025	108	98%	106
CA 12A. Jetty Rd to Aptos	2002-2025	489,624	100%	489,624
CA 12C. Monterey to Moss Lnd	2005-2025	2,696,267	100%	2,696,267
CA 15B. Atascadero Beach	2002-2025	191,947	100%	191,947
CA 15C. Morro Bay Beach	2002-2025	618,066	100%	618,066
CA 16. Pismo Beach/Nipomo	2002-2025	1,486,158	11%	163,477
CA 17A. Vandenberg North	2000-2025	19,625	100%	19,625
CA 17B. Vandenberg South	2000-2025	19,625	100%	19,625
CA 18. Devereaux Beach	2000-2025	73,972	100%	73,972
CA 27C. Silver Strand	2002-2025	285,836	100%	285,836

Exhibit 4-23

AVERAGE ANNUAL LOSS OF GENERAL BEACH RECREATION TRIPS IN POTENTIAL CRITICAL HABITAT IN OREGON

Area	Years of Impact	Average Annual Visits [a]	Participation [a]	Average Annual Visits Lost
Proposed for designation				
OR 3. Bayocean Spit	2005-2025	48,849	100%	48,849
OR 8D. Tenmile Creek Spit	1995-2025	8,758	100%	8,758
OR 10A. Bandon to Floras Lake	1997-2025	17,084	100%	17,084
Areas identified for possible inclusion				
OR 1A. Columbia River Spit	2006-2025	18,006	100%	18,006
OR 2. Nehalem River Spit	2006-2025	26,540	100%	26,540
OR 4. Netarts Spit	2006-2025	16,938	100%	16,938
OR 5B. Sand Lake South	2011-2025	12,922	100%	12,922
OR 8C. N Umpqua River Spit	2016-2025	874	61%	874
OR 10C. Elk River Spit	2016-2025	758	25%	758
OR 11. Euchre Creek Spit	2016-2025	1,067	100%	1,067
OR 12. Pistol River Spit	2021-2025	2,124	100%	2,124

[a] Shelby, Bo and John Tokarczyk. 2002. Oregon Shores Recreational Use Study. Prepared for Oregon Parks and Recreation Department.

Washington

195. As discussed earlier, exclosures may be erected at three units in Washington (WA-2, WA-3, and WA-4). These exclosures are expected to impact less than ten

percent of the linear extent of each beach. Therefore, this analysis does not incorporate losses due to diminished experiences in these areas.

Value Per Trip

196. As introduced earlier, Lew and Larson (2005) provide estimates of the utility gained from beach additional beach length in San Diego County.[149] While the authors do not report per-trip welfare losses associated with restricting access to lengths of beach, they do provide statistically significant parameter estimates for beach length for the conditional indirect utility function used in their model. This analysis estimates the derivative of the utility function, assuming that all variables other than length are the same for every beach. Applying the mean beach length in the study (2.06 miles) and dividing by the implicit price estimated for the utility function results in an estimated value of $1.42 (2004$) per beach mile.[150] It is important to note that this is not an explicit estimate of welfare value; it is used as an approximation of the welfare value associated with a mile of beach length.

197. Exhibit 4-24 summarizes key characteristics of the Lew and Larson study related to valuing diminished beach trips.

Exhibit 4-24

KEY CHARACTERISTICS OF LEW AND LARSON (2005) RELATED TO VALUATION OF BEACH LENGTH

Characteristic	Lew and Larson (2005)
Location	San Diego Beaches including San Onofre State-Camp Pendleton Beaches, South Carlsbad State Beach, Torrey Pines State Beach, Silver Strand State Beach, and Border Field State Beach
Population sampled	494 households in San Diego County
Valuation methodology	Travel Cost
Resource valued	General beach recreation, including beach length
Year of survey	2001
Average visits per year	12
Per-person consumer surplus per day per mile of beach ($2004)	$1.42

Sources: Lew, Daniel, *Valuing Recreation, Time, and Water Quality Improvements Using Non-Market Valuation: An Application to San Diego Beaches*, Doctoral Dissertation, University of California, Davis, 2002, p. 31. Lew, Daniel K. and Douglas M. Larson, "Valuing Recreation and Amenities at San Diego County Beaches," *Coastal Management* 33:71-86, 2005.

Loss Estimation

198. To estimate the aggregate annual pedestrian and equestrian losses, data on the number of trips taken to potentially affected beaches is combined with information about

[149] Lew, Daniel K. and Douglas M. Larson, "Valuing Recreation and Amenities at San Diego County Beaches," *Coastal Management* 33:71-86, 2005.

[150] Average beach length in the study is taken from Lew, Daniel, *Valuing Recreation, Time, and Water Quality Improvements Using Non-Market Valuation: An Application to San Diego Beaches*, Doctoral Dissertation, University of California, Davis, 2002, p. 31.

the linear extent of fencing and the value of a beach mile. Losses are calculated by multiplying the number of trips taken to a potentially affected beach during breeding season by the length of beach with fencing and by a value of $1.42 per beach mile. Then, annual losses are summed over the relevant time period.

199. Exhibit 4-25 presents past and future welfare losses to pedestrians and equestrians associated with experiencing diminished beach trips as a result of plover fencing. Past losses are calculated from 1993 through 2004. Future losses are calculated from 2005 through 2025. The total present value of past losses is approximately $17.8 million in current dollars, while the discounted estimates are $19.0 million and $20.6 million, using discount rates of three and seven percent (respectively). The total present value of future losses in units proposed for designation is approximately $298.7 million, expressed in current dollars. Losses are $221.0 million when a three percent discount rate is applied, and $157.0 million when a seven percent discount rate is applied. Future costs for areas identified for possible inclusion are $4.5 million in constant dollars. Losses are $3.2 million when a three present discount rate is applied and $2.2 million when a seven percent discount rate is applied. No costs are anticipated for areas proposed for exclusion.

Exhibit 4-25

ESTIMATED PAST AND FUTURE LOSSES TO PEDESTRIANS AND EQUESTRIANS FROM DIMINISHED BEACH TRIP EXPERIENCE ASSOCIATED WITH PLOVER FENCING WITHIN POTENTIAL CRITICAL HABITAT AREAS

Unit	Average Annual Trips Diminished	1993-2004			2005-2025		
		Constant Dollars	Present Value 3%	Present Value 7%	Constant Dollars	Present Value 3%	Present Value 7%
Proposed for designation							
OR 3. Bayocean Spit	49,000	$0	$0	$0	$2,141,000	$1,467,000	$923,000
OR 8D. Tenmile Creek Spit	9,000	$113,000	$134,000	$167,000	$251,000	$189,000	$138,000
OR 10A. Bandon to Floras Lake	17,000	$439,000	$502,000	$602,000	$1,211,000	$912,000	$663,000
CA 3A. Clam Beach/Little Riv	3,000	$14,000	$15,000	$17,000	$52,000	$38,000	$27,000
CA 4A. Humboldt Bay, S Spit	<$1,000	<$1,000	<$1,000	<$1,000	$2,000	$1,000	$1,000
CA 12A. Jetty Rd to Aptos	490,000	$4,709,000	$5,002,000	$5,411,000	$37,118,000	$27,470,000	$19,531,000
CA 12C. Monterey to Moss Lnd	2,696,000	$0	$0	$0	$150,608,000	$111,459,000	$79,246,000
CA 15B. Atascadero Beach	192,000	$825,000	$870,000	$933,000	$10,261,000	$7,594,000	$5,399,000
CA 15C. Morro Bay Beach	618,000	$8,176,000	$8,675,000	$9,372,000	$71,219,000	$52,707,000	$37,474,000
CA 16. Pismo Beach/Nipomo	163,000	$499,000	$528,000	$568,000	$5,067,000	$3,750,000	$2,666,000
CA 17A. Vandenberg North	20,000	$203,000	$220,000	$244,000	$1,245,000	$921,000	$655,000
CA 17B. Vandenberg South	20,000	$203,000	$220,000	$244,000	$1,245,000	$921,000	$655,000
CA 18. Devereaux Beach	74,000	$189,000	$206,000	$232,000	$1,032,000	$764,000	$543,000
CA 27C. Silver Strand	286,000	$2,425,000	$2,581,000	$2,800,000	$17,264,000	$12,777,000	$9,084,000
Total Proposed Units	**4,637,000**	**$17,795,000**	**$18,953,000**	**$20,590,000**	**$298,716,000**	**$220,970,000**	**$157,005,000**
Areas identified for possible inclusion							
OR 1A. Columbia River Spit	18,000	$0	$0	$0	$909,000	$674,000	$478,000
OR 2. Nehalem River Spit	27,000	$0	$0	$0	$2,312,000	$1,714,000	$1,215,000
OR 4. Netarts Spit	17,000	$0	$0	$0	$303,000	$178,000	$90,000
OR 5B. Sand Lake South	13,000	$0	$0	$0	$775,000	$531,000	$334,000
OR 8C. N Umpqua River Spit	1,000	$0	$0	$0	$36,000	$23,000	$13,000
OR 10C. Elk River Spit	1,000	$0	$0	$0	$74,000	$47,000	$26,000
OR 11. Euchre Creek Spit	1,000	$0	$0	$0	$17,000	$11,000	$6,000
OR 12. Pistol River Spit	2,000	$0	$0	$0	$28,000	$16,000	$8,000
Total Possible Units	**80,000**	**$0**	**$0**	**$0**	**$4,454,000**	**$3,194,000**	**$2,170,000**

Note: Totals may not sum due to rounding.

200. Although the average annual number of beach visitors assumed to experience a loss using this method is larger than in the first method, the total value of the loss experience by the public using this method is over three times lower. This difference is due mainly to the fact that the value of an entire beach trip ($30) is significantly greater than the loss associated with a diminished trip ($1.42 per beach mile lost). As a result, the potential magnitude of impact of plover conservation efforts is significantly influenced by whether users forego beach trips.

4.5.2 Mechanical Beach Cleaning Restrictions

201. Los Angeles, Orange, and San Diego Counties, California clean public beaches using a method called mechanized beach raking. Mechanized beach raking at Will Rogers State Beach (CA-21A), Dockweiler State Beach (CA-21B and CA-21C), and Hermosa City Beach (CA-21D) may be impacted by plover conservation efforts. Los Angeles County performs mechanized beach raking on each of these beaches daily.[151] Mechanical beach cleaning may crush plover clutches and chicks and reduce food sources. Conservation measures for the plover include reducing the frequency of mechanical beach cleaning in the area occupied by plover.[152]

202. Reducing the frequency of mechanical beach cleaning will result in a buildup of organic materials and trash. The buildup of these materials may create an unpleasant odor and/or attract insects to the beach. Depending on the frequency of beach cleaning and the size of the plover habitat, reduced cleaning may diminish enjoyment of the beach for recreationists. This analysis estimates the number of beach trips that are diminished by the plover conservation efforts, and applies a literature-based per-trip dollar value to estimate losses.

<u>Number of Trips</u>

203. This analysis of the impact of mechanical beach cleaning restrictions assumes recreators do not forego a beach day as a result of less frequent beach raking; rather, their beach experience is diminished. Los Angeles County provided estimated beach attendance for the affected beaches in 2003 and 2004.[153] To project future visitation this analysis assumes that visitation rates are similar to the historic trend of State park visitation (i.e., increase two percent annually).[154] This analysis assumes mechanized beach raking is reduced in the portion of each area of potential critical habitat in Will Rogers State Beach (CA-21A), Dockweiler State Beach (CA-21B and CA-21C), and Hermosa City Beach (CA-21D). Exhibit 4-26 presents the average annual trips taken to

[151] Public comments submitted by Joseph Chesler, Chief of the Los Angeles County Planning Division, February 15, 2005.

[152] Plovers are assumed to occupy these areas in winter months, between September and March.

[153] Public comments submitted by Joseph Chesler, Chief of the Los Angeles County Planning Division, February 15, 2005.

[154] This rate is based on Southwest Life Guard Visitation data for all California State Parks from 1967 to 2003. United States Lifesaving Association accessed at http://www.usla.org/Statistics/public.asp, on January 19, 2005. Historic visitation was not estimated, as plover conservation efforts have not been implemented to date.

the potential critical habitat areas likely to experience losses associated with reduced mechanized beach raking.

Exhibit 4-26

AVERAGE ANNUAL BEACH USE TRIPS IN POTENTIAL CRITICAL HABITAT IN CALIFORNIA LIKELY TO BE IMPACTED BY REDUCED MECHANIZED BEACH RAKING

Unit	Years of Impact	Average Seasonal Visitors Per Mile	Restriction (Miles)	Average Seasonal Diminished Trips
CA 21A. Santa Monica Beach	2005-2025	205,971	0.2	41,194
CA 21B. Dockweiler N	2005-2025	258,463	0.5	129,232
CA 21C. Dockweiler S	2005-2025	258,463	0.5	129,232
CA 21D. Hermosa Beach	2005-2025	442,056	0.6	265,233

Source: Public comments submitted by Joseph Chesler, Chief of the Los Angeles County Planning Division. February 15, 2005.

Value Per Diminished Trip

204. To identify an appropriate per-trip value for a beach trip diminished by reduced mechanized beach cleaning, the economics literature was reviewed for valuation studies addressing sites with similar attributes. In his doctoral dissertation, Zhang uses contingent valuation to estimate the reduction in welfare associated with marine debris on beaches in New Jersey and North Carolina.[155] This study estimates a per-person, per-day value for reducing marine debris of six dollars (2004$). Portions of this research were subsequently published in *Environmental and Resource Economics* (see Smith et al., 1997). The author appears to have followed a careful research design, including the conduct of focus groups and a pre-test prior to final survey development. Exhibit 4-27 compares the characteristics of Zhang's study to the beaches potentially affected by plover conservation efforts.

[155] Zhang, Xiaolong, *Integrating Resource Types, Access Conditions, and Preference Differences Into Models for Use and Nonuse Values: The Case of Marine Debris Control*, Doctoral Dissertation North Carolina State University, 1995.

Exhibit 4-27

KEY CHARACTERISTICS OF ZHANG (1995)
RELATED TO VALUATION OF BEACH LITTER REDUCTION

Characteristic	Zhang (1995)
Location	New Jersey and North Carolina
Valuation Methodology	Contingent Valuation
Resource valued	Enforcement and beach cleanup
Population sampled	Residents of New Jersey and North Carolina
Year of survey	1992
Average trips per year	New Jersey – 11.8 North Carolina – 10.6
Estimated per-person, per-day value for reducing marine debris ($2004)	$6

Sources: Zhang, Xiaolong, *Integrating Resource Types, Access Conditions, and Preference Differences Into Models for Use and Nonuse Values: The Case of Marine Debris Control*, Doctoral Dissertation North Carolina State University, 1995; Smith, Kerry, Xiaolong, Zhang, and Raymond Palmquist. 1997. Marine Debris, Beach Quality, and Non-Market Values. *Environmental and Resource Economics* 10:223-247.

Loss Estimation

205. To estimate the effect of reduced beach raking, the valuation information on consumer surplus losses resulting from marine debris on beaches is combined with estimates of the number of diminished trips. Diminished trip losses are calculated by multiplying the annual estimated number of trips taken by the per day value ($6). This approach assumes that all trips are taken and not foregone or substituted elsewhere. Annual losses are then summed over the relevant time period.

206. As discussed above there have been no past losses, because no restrictions on beach raking currently exist. Future losses are calculated from 2005 to 2025. The total present value of future losses, expressed as current dollars, is approximately $89 million (2004$). Using discount rates of three and seven percent yields estimates of $65.9 million and $46.8 million, respectively. Exhibit 4-28 summarizes these results.

Exhibit 4-28

TOTAL LOSS OF REDUCED MECHANIZED BEACH
RAKING IN POTENTIAL CRITICAL HABITAT AREAS

Unit	Average Seasonal Diminished Trips	Present Value of Total Loss		
		Current Dollars	3%	7%
CA 21A. Santa Monica Beach	51,589	$6,491,000	$4,804,000	$3,415,000
CA 21B. Dockweiler N	161,841	$20,363,000	$15,070,000	$10,714,000
CA 21C. Dockweiler S	161,841	$20,363,000	$15,070,000	$10,714,000
CA 21D. Hermosa Beach	332,160	$41,793,000	$30,929,000	$21,990,000
Total [a]	**707,431**	**$89,010,000**	**$65,873,000**	**$46,833,000**

[a] Totals may not sum due to rounding.

4.6 Regional Economic Impacts

207. If, as estimated using Method One, fewer beach recreational trips are taken to areas within potential critical habitat, a reduction in expenditures in beach recreation-related industries in those regions may result. The bulk of expenditures made by recreationists, in terms of consumable goods, occur in the counties containing potential critical habitat areas. These counties benefit from the millions of visitors who recreate on California, Oregon, and Washington beaches and make significant trip-related expenditures.

208. The reductions in expenditures associated with past plover conservation efforts likely affected the county economies in a number of ways, primarily through decreased spending on fuel, food, equipment, sporting goods, and lodging. Decreased expenditures in these industries would also result in secondary effects on related sectors in the counties such as businesses supplying goods to restaurants, hotels, and retail stores. Some of these related sectors may be closely associated with the beach recreation industry, such as sporting good industries; however, some sectors may be less closely associated with the beach recreation industry, such as the food service industry.

209. This analysis relies on regional economic modeling to estimate the economic impacts of these initial and secondary effects. In particular, it utilizes a software package called IMPLAN to estimate the total economic effects of the reduction in economic activity in the beach recreation-related industries in the 21 counties associated with plover conservation efforts. IMPLAN is commonly used by State and Federal agencies for policy planning and evaluation purposes. The model draws upon data from several Federal and State agencies, including the Bureau of Economic Analysis and the Bureau of Labor Statistics.[156] To group related industries into sectors, IMPLAN utilizes the categories defined by the U.S. Office of Management and Budget's North American Industry Classification System (NAICS) code.

210. IMPLAN translates initial changes in expenditures into changes in demand for inputs to affected industries. These effects can be described as direct, indirect, or induced, depending on the nature of the change.

- **Direct effects** represent changes in output attributable to a change in demand or a supply shock. These are specified initially by the modeler (e.g., the change in recreation expenditures on goods and services, by sector).[157]

- **Indirect effects** are changes in output of industries that supply goods and services to those that are directly affected by the initial change in expenditures.

- **Induced effects** reflect changes in household consumption, arising from changes in employment (which in turn are the result of direct and indirect effects). For example,

[156] The IMPLAN model is owned and maintained by the Minnesota IMPLAN Group, Inc. (MIG). Information in this section is compiled in part from: *IMPLAN Professional, Social Accounting, and Impact Analysis Software, User's Guide, Analysis Guide, Data Guide*, Minnesota IMPLAN Group, Inc., 1997.

[157] Output is the value of all good and services produced.

changes in employment in a region may affect the consumption of certain goods and services.

These categories are calculated for all industries and aggregated to determine the regional economic impact of reduced beach recreation-related expenditures potentially associated with plover conservation efforts.

211. There are two important caveats relevant to the interpretation of IMPLAN model estimates, generally, and within the context of this analysis. The first is that the model is static in nature and measures only those effects resulting from a specific policy change (or the functional equivalent specified by the modeler) at one point in time. Thus, IMPLAN does not account for posterior adjustments that may occur, such as the subsequent re-employment of workers displaced by the original policy change. In this analysis, this caveat suggests that the long-run net output and employment effects resulting from changes in plover conservation efforts are smaller than those estimated in the model, which will lead to an upward bias in the estimates. A second caveat to the IMPLAN analyses is related to the model data. The IMPLAN analysis relies upon input/output relationships derived from 1998 data. Thus, this analysis assumes that this characterization of the affected counties economies are a reasonable approximation of current conditions. If significant changes have occurred in the structure of the economies of these 21 counties over the previous six years, the results may be sensitive to this assumption. However, the magnitude and direction of any such bias are unknown.

212. To estimate the regional economic impact of lost beach recreation trips, the analysis relies on information on the total number of trips potentially lost due to plover conservation efforts and an estimate of the expenditures made per beach recreation-related trip.

- **Lost Beach Recreation Trips:** Based on the analysis described in Section 4.1, this analysis assumes that 1.5 million trips are lost in an average year between 2005 and 2025.

- **Expenditures per Trip:** Estimates for average expenditures per beach-recreation trip are based on three sources: King (1999), King (2002), and King (2003).[158] In King (1999) beach recreation day trip expenditures are estimated for California households that recreate on California's beaches. In 2002 King estimated beach spending of visitors to the beaches of the City of San Clemente. King estimated spending by California day trippers, California vacationers, U.S. vacationers, and foreign vacationers visiting southern California beaches in 2003. The amount spent in each expenditure category is averaged across studies.[159] As reflected in Exhibit 4-29,

[158] King, Philip, *Economic Analysis of Beach Spending and the Recreational Benefits of Beaches in the City of San Clemente*, 2002; King, Philip, *The Fiscal Impact of Beaches in California*, prepared for the California Department of Boating and Waterways, 1999; and King, Philip, *The Potential Loss in Gross National Product and Gross State Product from a Failure to Maintain California's Beaches*, prepared for the California Department of Boating and Waterways, 2003.

[159] For the King (2003) study the expenditures in each category were estimated by taking a weighted average of the expenditure by visitor group (i.e., California day trippers, California vacationers, US vacationers, and

this analysis estimates average beach recreation-related trip expenditures are $51 per day per individual for past and future and ongoing losses (2004$).

Exhibit 4-29

BEACH RECREATION-RELATED EXPENDITURES
(2004 dollars)

Expenditure Category	Expenditure Estimate
Gas & Auto	$9.18
Parking & Entrance Fees	$1.77
Food & Drinks from Stores	$14.23
Restaurants	$14.70
Equipment and Rental	$1.05
Beach Sporting Goods	$0.97
Incidentals/Sundries	$4.52
Lodging	$4.52
Total	**$50.94**

Source(s): King, Philip, *Economic Analysis of Beach Spending and the Recreational Benefits of Beaches in the City of San Clemente*, 2002; King, Philip, *The Fiscal Impact of Beaches in California*, prepared for the California Department of Boating and Waterways, 1999; and King, Philip, *The Potential Loss in Gross National Product and Gross State Product from a Failure to Maintain California's Beaches*, prepared for the California Department of Boating and Waterways, 2003.

213. The total decrease in expenditures in an average year between 2005 and 2025 is calculated by multiplying the average per-trip expenditures by the number of trips not taken in each potential critical habitat area (Exhibit 4-30). The total number of foregone trips in an average year between 2005 and 2025 is anticipated to be about 1.5 million. A reduction in 1.5 million trips therefore results in decreased expenditures of approximately $75.2 million.

foreign vacationers). This analysis assumes that the value of an expenditure category is zero if it is not estimated in a study.

Exhibit 4-30

AVERAGE ANNUAL REDUCTION IN BEACH RECREATION-RELATED EXPENDITURES

Unit	Lost Visitation in Average Year 2005-2025	Average Expenditures Per Trip	Lost Expenditures
Proposed for designation			
OR 8D. Tenmile Creek Spit	155	$51	$8,000
OR 9. Coos Bay N. Spit	2	$51	<$1,000
OR 10A. Bandon to Floras Lake	191	$51	$10,000
CA 3A. Clam Beach/Little Riv	1,109	$51	$56,000
CA 3B. Mad River	31	$51	$2,000
CA 4A. Humboldt Bay, S Spit	11	$51	$1,000
CA 12A. Jetty Rd to Aptos	143,689	$51	$7,319,000
CA 12C. Monterey to Moss Lnd	560,793	$51	$28,566,000
CA 15B. Atascadero Beach	74,498	$51	$3,795,000
CA 15C. Morro Bay Beach	197,931	$51	$10,082,000
CA 16. Pismo Beach/Nipomo	209,164	$51	$10,655,000
CA 17A. Vandenberg North	70,184	$51	$3,575,000
CA 17B. Vandenberg South	70,184	$51	$3,575,000
CA 18. Devereaux Beach	10,026	$51	$511,000
CA 27C. Silver Strand	136,627	$51	$6,960,000
Total Proposed Units	**1,474,595**		**$75,115,000**
Areas considered for possible inclusion			
OR 1A. Columbia River Spit	13	$51	$1,000
OR 2. Nehalem River Spit	500	$51	$25,000
OR 5B. Sand Lake South	298	$51	$15,000
OR 8C. N Umpqua River Spit	106	$51	$5,000
OR 10C. Elk River Spit	7	$51	$0
OR 12. Pistol River Spit	306	$51	$16,000
Total Possible Units	**1,231**		**$62,000**

Note: Totals may not sum due to rounding.

214. Incorporating multiplier effects in the regional economy, the estimated impact of a loss of 1.5 million trips in an average year between 2005 and 2025 is $127.1 million (Exhibit 4-31) in units proposed for designation in California, Oregon, and Washington. This loss represents 0.01 percent of the annual baseline economy of the counties included in this analysis. The loss of 1.5 million trips is also estimated to impact as many as about 1,900 jobs. This loss represents 0.02 percent of the annual baseline jobs in the counties included in this analysis. These estimates represent snapshots of the changes in revenues, jobs, and local taxes that may result from plover conservation efforts. These impacts would occur and persist for some period of time until the economy adjusts to the change.

Exhibit 4-31

REGIONAL ECONOMIC IMPACTS OF PLOVER CONSERVATION EFFORTS ON BEACH RECREATION

Unit	Direct Output (Employment)	Indirect Output (Employment)	Induced Output (Employment)	Total Output (Employment)
Proposed for designation				
OR 8D. Tenmile Creek Spit	$7,902 (0)	$1,628 (0)	$3,796 (0)	$13,327 (0)
OR 9. Coos Bay N. Spit	$117 (0)	$24 (0)	$56 (0)	$197 (0)
OR 10A. Bandon to Floras Lake	$9,763 (0)	$2,012 (0)	$4,690 (0)	$16,465 (0)
CA 3A. Clam Beach/Little Riv	$56,670 (1)	$11,677 (0)	$27,226 (0)	$95,574 (1)
CA 3B. Mad River	$1,594 (0)	$328 (0)	$766 (0)	$2,688 (0)
CA 4A. Humboldt Bay, S Spit	$541 (0)	$111 (0)	$260 (0)	$912 (0)
CA 12A. Jetty Rd to Aptos	$7,342,589 (138)	$1,512,965 (13)	$3,527,644 (37)	$12,383,199 (187)
CA 12C. Monterey to Moss Lnd	$28,656,797 (539)	$5,904,830 (49)	$13,767,757 (143)	$48,329,384 (731)
CA 15B. Atascadero Beach	$3,806,859 (72)	$784,416 (7)	$1,828,952 (19)	$6,420,227 (97)
CA 15C. Morro Bay Beach	$10,114,366 (190)	$2,084,099 (17)	$4,859,306 (50)	$17,057,772 (258)
CA 16. Pismo Beach/Nipomo	$10,688,405 (201)	$2,202,382 (18)	$5,135,095 (53)	$18,025,882 (273)
CA 17A. Vandenberg North	$3,586,455 (67)	$739,001 (6)	$1,723,062 (18)	$6,048,517 (92)
CA 17B. Vandenberg South	$3,586,455 (67)	$739,001 (6)	$1,723,062 (18)	$6,048,517 (92)
CA 18. Devereaux Beach	$512,328 (10)	$105,567 (1)	$246,141 (3)	$864,036 (13)
CA 27C. Silver Strand	$6,981,700 (131)	$1,438,603 (12)	$3,354,260 (35)	$11,774,563 (178)
Total Proposed Units	**$75,352,541 (1,418)**	**$15,526,646 (130)**	**$36,202,074 (375)**	**$127,081,260 (1,922)**
Areas considered for possible inclusion				
OR 1A. Columbia River Spit	$683 (0)	$141 (0)	$328 (0)	$1,152 (0)
OR 2. Nehalem River Spit	$25,531 (0)	$5,261 (0)	$12,266 (0)	$43,059 (1)
OR 5B. Sand Lake South	$15,243 (0)	$3,141 (0)	$7,323 (0)	$25,707 (0)
OR 8C. N Umpqua River Spit	$5,441 (0)	$1,121 (0)	$2,614 (0)	$9,176 (0)
OR 10C. Elk River Spit	$361	$74	$174	$609

Exhibit 4-31 REGIONAL ECONOMIC IMPACTS OF PLOVER CONSERVATION EFFORTS ON BEACH RECREATION				
Unit	**Direct Output (Employment)**	**Indirect Output (Employment)**	**Induced Output (Employment)**	**Total Output (Employment)**
	(0)	(0)	(0)	(0)
OR 12. Pistol River Spit	$15,655 (0)	$3,226 (0)	$7,521 (0)	$26,402 (0)
Total Possible Units	**$62,914** **(1)**	**$12,964** **(0)**	**$30,226** **(0)**	**$106,104** **(2)**
Note: Totals may not sum due to rounding.				

4.7 Caveats

215. It is important to recognize the uncertainty inherent in the assumptions underlying this analysis of potential recreational impacts. Exhibit 4-32 discusses the uncertainties associated with this analysis of the impacts of potential plover conservation efforts.

Exhibit 4-32

CAVEATS TO THE ECONOMIC ANALYSIS OF RECREATIONAL IMPACTS

Key Assumption	Effect on Impact Estimate
In the estimation of losses related to foregone beach trips, the analysis does not allow for participation at a substitute site or in a substitute activity. To the extent that visitors chose to recreate at another beach or in another way, this analysis overstates the impact of plover conservation efforts.	+
This analysis uses the value of a mile of beach at sites in San Diego County as a proxy for the value of the disamenity resulting from plover restrictions (e.g., symbolic fencing, exclosures, closures). To the extent that people are able to walk around fencing or exclosures, this analysis may overstate the impact of plover conservation efforts.	+
This analysis relies on the value of a mile of beach taken from a study of beach sites in San Diego County, where numerous substitute sites exist. To the extent that numerous substitute sites are not available for beaches in this analysis, this value may understate the impact of plover conservation efforts.	-
To estimate the loss associated with restrictions on OHV use, this analysis relies on welfare values for similar activities at inland locations in Utah and North Carolina. The effect of applying values for inland sites to estimate losses in this analysis is uncertain.	+ / -
To estimate the loss associated with increased marine debris from reduced mechanical beach raking, this analysis uses a welfare value from a study of beaches in New Jersey and North Carolina. A review of the economics literature indicates that welfare values associated with beach recreation can vary significantly from the East Coast to the West Coast of the US. The effect of applying an East Coast value to estimate this category of loss is uncertain.	+ / -
This analysis relies on publicly available information on beach visitation and projects future visitation to 2025. If demand for beach visits changes in a manner different from historical State park attendance, this analysis will under- or over-state impacts associated with plover conservation activities.	+ / -
For some beaches, visitation data that form the basis of the impact estimates was collected after plover conservation efforts were implemented. To the extent that the number of recorded visits is less than the number of people that would have visited the site in the absence of plover conservation efforts, this analysis may understate impacts.	-
In estimating foregone beach trips, this analysis assumes visitation is distributed evenly over the entire beach. To the extent visitors congregate around access points, this analysis overstates the consumer surplus losses associated with plover conservation efforts.	+
Plover-related vehicle restrictions may increase the consumer surplus value of a beach day for other recreational user groups. Other recreational uses such as children's play, fishing, clamming, walking, jogging, dog walking, horseback riding, etc. also occur in the wetted sand. To the extent other recreational user groups prefer beaches without vehicles, this analysis overstates the impact of plover conservation efforts.	+

- : This assumption may result in an underestimate of real costs.
+ : This assumption may result in an overestimate of real costs.
+/-: This assumption has an unknown effect on estimates.

POTENTIAL ECONOMIC IMPACTS TO RESIDENTIAL AND RELATED DEVELOPMENT SECTION 5

216. This section evaluates how conservation activities to protect the plover and its habitat may affect real estate development and markets in potential critical habitat. Specifically, it focuses on the direct and indirect economic effects resulting from plover conservation efforts and any "co-extensive" land use regulations affecting residential and commercial real estate within or adjacent to potential critical habitat for the plover. Impacts of particular activities related to development are addressed in other sections of this report. For example, real estate development may increase demand for recreational opportunities; impacts of plover conservation on recreation in the critical habitat are contemplated in Section 4 of this report. Administrative costs associated with consultations regarding the plover and habitat are quantified in Section 3 of this report.

217. This section first describes the methodology employed in determining the development potential of the units within each State and summarizes the associated findings. It then describes development regulations and the likelihood of development within each potential critical habitat unit in greater detail.

5.1 Methodology

218. This section characterizes how plover conservation efforts may affect real estate development and markets in the potential critical habitat areas, both directly and indirectly. It then outlines the specific steps applied to determine the likelihood of development in each of the potential critical habitat units and areas.

219. The units and areas considered for critical habitat designation by the Service in the proposed rule comprise primarily open sand beach areas down to the low mean water line. The Service attempts to avoid designating areas of existing development, including buildings, boat ramps, parking lots, etc., as these areas do not contain the primary constituent elements on which the plover depends.[160] The sandy substrate of the potential critical habitat is not typically conducive to construction. It is therefore unlikely that development exists, or will be proposed or permitted directly, within these areas.

220. Accordingly, this analysis focuses on potential development projects adjacent to the habitat areas; that is, areas above the open sand beach that may be subject to

[160] U.S. Fish and Wildlife Service, *Proposed Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004.

development. Development of these adjacent areas may directly and/or indirectly affect the plover and habitat.

221. Direct impacts include limiting commercial and private developments' beach access. That is, docks, piers, and stairways leading to or through beach areas may be precluded or regulated. Further, larger development projects may create habitat conservation plans (HCPs) proposing purchase of "mitigation lands" associated with potential incidental take of the plover. Maintenance or construction of beach structures, such as jetties, may also require modification due to the presence of plover or habitat. These activities may, for example, require alternate routes for transportation of materials or the implementation of project windows to avoid plover nesting season. These types of impacts are investigated in this analysis.

222. Indirect threats from development may include, for example, increased recreational use of the beaches containing habitat, or increased ambient light and noise. These increased human/beach interactions may make the area less attractive to the plovers for nesting or breeding. Likewise, property value research demonstrates that residential developments closer to the shoreline are more valuable than developments further from the coast.[161] Components of ocean access that may affect property value include aesthetics (i.e., view) and recreational access. Research was not identified, however, that correlated level of beach access to property value. In other words, no data are available to estimate potential percentage decrease in property values if access to nearby beaches is restricted.

223. County planners contacted for the purposes of the development analysis indicated that much of the concern regarding impacts of plover conservation on development are focused on the potential for recreational use of the beach. For example, developers or landowners are concerned that decreased recreational access to nearby beaches due to plover conservation may make adjacent properties less attractive to buyers or renters. This may be manifested in decreases in land and property values for areas abutting potential critical habitat. For example, counsel for landowners in the Dillon Beach area of potential critical habitat (unit CA-7) submitted a petition to the Service to be excluded from critical habitat, in part citing, "The future use of beachfront property would be negatively impacted if the actual beachfront was not available for normal recreational activities because of restrictions related to WSP (plover) protection."[162]

224. The ultimate effect that beach access has on property value in the areas containing potential critical habitat for the plover is unclear. This analysis therefore acknowledges that landowners may experience some impact in the form of decreased property values if beach access is limited by plover conservation efforts. These potential impacts, however, are not captured in this analysis due to data limitations. The analysis of potential impacts

[161] Brookshire et al., "Valuing Public Goods: A Comparison of Survey and Hedonic Approaches," *The American Economic Review*, March 1982, pp. 165-177; Mendelsohn, et al., "Measuring Hazardous Waste Damages with Panel Models," *Journal of Environmental Economics and Management* 22:259-271, 1992.

[162] Law Offices of Thomas D. Roth, "Section 4(b)(2) Petition to Exclude Certain Lands in Dillon Beach, California from Proposed Critical Habitat for the Western Snowy Plover," submitted on February 15, 2005.

to recreation on the beaches containing plover habitat is contained in Section 4 of this report.

225. The evaluation of impacts of plover conservation efforts on development has several steps:

1) *Describe regulation of development in coastal areas within each State containing potential critical habitat.* This involved contacting relevant State agencies and reviewing pertinent State regulations and guidelines.

2) *Contact each county or city containing potential critical habitat and consult relevant zoning maps to determine:*
   - How counties permit development of coastal areas;
   - The current status of residential and commercial development in potential critical habitat; and
   - The likelihood and type of future development in these areas.

3) *Classify each potential critical habitat unit or area as having low, medium or high development potential according to the following characteristics:*
   - **High:** Areas of high development potential are subject to existing development plans. Specific proposals exist for development projects within or adjacent to these areas that will likely require consideration of the plover or habitat.
   - **Medium:** Medium development potential describes areas in which zoning and geography are conducive to future development, but for which no development plans or proposals currently exist. While development of these areas may be impacted by plover conservation efforts in the future, information is not available to determine whether and how projects may be affected.
   - **Low:** Areas characterized as having low development potential are not amenable to development (e.g., area geology may not support construction of infrastructure); are protected in some way from development (e.g., as part of a State park, National Wildlife Refuge, or military lands); are already built out; or are otherwise not attractive to developers according to county planning departments.

4) *For areas of high development potential, estimate costs to past or future development projects where information is available.*

5.2 Summary of Results

226. One development project within the potential critical habitat area for the plover – the Monterey Bay Shores Development Project at Sand City – has quantifiable economic impacts. These costs are summarized in Exhibit 5-1. Annualized costs by unit are presented in Appendix E.

Exhibit 5-1

PAST IMPACTS OF PLOVER CONSERVATION ON DEVELOPMENT

Unit Description	Project and Impact Description	Constant Dollars	Present Value (3%)	Present Value (7%)
CA-12C, Monterey to Moss Landing (Monterey, CA)	*Monterey Bay Shores Development Project*			
	Administrative costs of HCP development.	$300,000 - $400,000	$319,000 - $425,000	$345,000 - $460,000
	Sand City purchase of private lands for open space and habitat (see Section 5.3.3).	$3.5 million - $4.0 million	$3.5 million - $4.0 million	$3.5 million - $4.0 million

227. Where information is available, this analysis also estimates future economic impacts on development projects associated with plover conservation over a 20-year time horizon. Impacts are estimated associated with the Humboldt County Campgrounds and Monterey Bay Shores Development Projects within potential critical habitat as summarized in Exhibit 5-2. While development potential exists in other potential critical habitat areas, no existing plans are available to determine what types of project modification may be undertaken for the purposes of plover conservation, and therefore the potential economic impact to the projects is unknown.

Exhibit 5-2

FUTURE IMPACTS OF PLOVER CONSERVATION ON DEVELOPMENT (2005 – 2025)

Unit Description	Project and Impact Description	Economic Impact
CA-3A: Clam Beach / Little River (Humboldt County, CA)	*Humboldt County Campground Improvements* Humboldt County plans to formalize an informal camping facility this year. The improvements will not involve expanding the campground's capacity due to presence of plover habitat. This will result in revenue losses to the county of $30,000 per year over the next twenty years (see Section 5.3.3).	Constant Dollars - $630,000
		Present Value (3%) - $476,000
		Present Value (7%) - $348,000
CA-12C, Monterey to Moss Landing (Monterey, CA)	*Monterey Bay Shores Development Project* Sand City hiring of full time stewards to monitor plover at $50,000 to $100,000 per year (see Section 5.3.3).	Constant Dollars - $1,050,000 to $2,100,000
		Present Value (3%) - $794,000 - $1,590,000
		Present Value (7%) - $580,000 to $1,160,000

5.3 Development in Potential Critical Habitat in California

5.3.1 California: Regulation of Development

228. The California Environmental Quality Act (CEQA) is a California State statute requiring State and local agencies ("lead agencies") to identify potentially significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. The lead agencies must prepare an Environmental Impact Report (EIR) if the project may

produce certain types of environmental and ecological impacts, including habitat degradation, or impacts to wildlife populations. Projects without a mandatory finding of significance and in which the lead agency finds no significant impacts may be approved by a lead agency through a "negative declaration." Alternatively, a lead agency may offer project plans redesigned to account for significant impacts in what is known as a "mitigated negative declaration."[163]

229. Minor development projects, including alterations or replacements of existing facilities and structures, and developments smaller than 2,500 square feet are eligible for a categorical CEQA exemption. Potential CEQA-associated impacts are therefore limited to large development projects.[164] It is possible that large development projects potentially affecting the plover or habitat may experience additional requirements in the preparation of an EIR due to the consideration of sensitive species and habitat. The sole large development project identified in California within or adjacent to the potential critical habitat for the plover is the Sand City Development discussed in Section 5.3.3.

230. The California Coastal Act of 1976 (the Coastal Act) established the California Coastal Commission (CCC), which oversees development in the coastal zone.[165] In addition, the Coastal Act requires that each of the 15 counties and 59 cities in the coastal zone develop a Local Coastal Program (LCP), which, once approved by the CCC, regulates all development in the coastal regions of the State. A county or city with an LCP is responsible for reviewing most development permits for proposed coastal projects; counties or cities without LCPs defer applications directly to the CCC. Projects that require Federal permitting (e.g., a USACE 404 permit) are permitted directly though the CCC, as opposed to a local government. These types of projects, however, occur relatively infrequently. A developer may also appeal a project not approved by a local government to the CCC. Finally, the CCC has primary authority over any development on tidelands, submerged lands, or public trust lands.[166]

231. According to the Coastal Act, any development that involves the placement of any solid material or structure, a change in land use density or intensity (including subdivision), a change in the intensity of water use or access to water, or the removal of major vegetation requires a coastal permit from either the county or city government with an approved LCP, or from the CCC. Development projects exempt from permit review include repairs and improvements to single-family homes, replacement of structures destroyed by natural disasters, and certain temporary events in the coastal zone.[167]

232. The CCC may place "conditions on concurrence" for approval of a project. That is, it may agree that a project may proceed with certain stipulations, for example implementation of plover conservation efforts. The CCC has not placed "conditions on

[163] California Natural Resources Code, Section 15065(a).

[164] Ibid.

[165] According to the CCC, the coastal zone varies from several hundred feet inland in urban areas to up to five miles inland in rural areas. See http://www.coastal.ca.gov/whoweare.html for further information.

[166] Personal communication with Larry Simone, California Coastal Commission, on March 7, 2005.

[167] California Coastal Commission, "California Coastal Commission: Why it Exists and What it Does," accessed at http://www.coastal.ca.gov/publiced/Comm_Brochure.pdf on April 4, 2005.

concurrence" on any proposed development projects in the past due to the presence of plover or habitat.[168]

5.3.2 California: Distribution of Development

233. Exhibit 5-3 specifies the development potential of each potential critical habitat unit or area in California. Areas of high development potential are highlighted in Exhibit 5-4. Specific development projects in these areas are detailed in Section 5.3.3.

[168] Personal communication with Larry Simone, California Coastal Commission, on March 7, 2005.

Exhibit 5-3

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN CALIFORNIA

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
CA-3A: Clam Beach / Little River (155 acres)	Proposed for designation	Humboldt	High	This area contains both Little River State Beach and Clam Beach County Park. Private inholdings also exist adjacent to potential habitat. Current development plans include improvements to existing county campgrounds and a private RV park as discussed in Section 5.3.3. (Personal communication with Tom Hofweber, Humboldt County Planning Division on March 16, 2005, and Cheryl Dillingham, Humboldt County Public Works on April 4, 2005)	46.5%
CA-12C: Monterey to Moss Landing (803 acres)	Proposed for designation	Monterey	High	This area is experiencing high development pressure in the form of a large-scale development project at Sand City. The project has been in the planning stages for decades and developers and the City are in the process of developing a habitat conservation plan (HCP) as discussed in Section 5.3.3. (Personal communication with Tom Roth, Attorney for Sand City)	40.0%
CA-19A: Mandalay Beach to Santa Clara River Mouth (350 acres)	Proposed for designation	Ventura	High	The North Shore-Mandalay Bay 300-home subdivision (east of Harbor Blvd.) was recently approved subject to a hearing later this year. The project is not anticipated to directly impact plover habitat, but a proposed 16-acre mitigation area for Ventura Marsh milk-vetch may encroach on plover habitat as described in Section 5.3.3. (Personal communication with Liz Chattin, Ventura County Planning Division, March 10, 2005, and Sue Martin, City of Oxnard Planning and Environmental Services, March 14, 2005)	49.6%
CA-1: Lake Earl (91 acres)	Proposed for designation	Del Norte	Medium	Development, while often proposed in this area, is unlikely to occur for reasons unrelated to the plover as discussed in Section 5.3.4. (Personal communication with Ernie Perry, Del Norte County Planning Division on March 22, 2005)	87.0%

Exhibit 5-3

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN CALIFORNIA

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
CA-4B: Eel River; North Spit and Beach (283 acres)	Proposed for designation	Humboldt	Medium	Nearby areas are zoned for residential development. Potential development, however, is too remote from beach areas to impact plover or habitat as described in Section 5.3.4. (Personal communication with Tom Hofweber, Humboldt County Planning Division on March 16, 2005)	3.0%
CA-4C: Eel River; South Spit and Beach (402 acres)	Proposed for designation	Humboldt	Medium	These primarily private lands have some development potential, though development is unlikely as described in Section 5.3.4. (Personal communication with Tom Hofweber, Humboldt County Planning Division on March 16, 2005)	97.0%
CA-7: Dillon Beach (30 acres)	Proposed for designation	Marin	Medium	Lawson Landing area is primarily private land, zoned for "coastal-recreational-commercial" development. However, no development plans are currently proposed within or adjacent to the potential unit. (Personal communication with Kristin Drumm, Marin County Planning Commission on March 9, 2005)	91.7%
CA-11B: Scott Creek Beach (19 acres)	Proposed for designation	Santa Cruz	Medium	Development is limited in this area surrounding Scott Creek Beach. (Personal communication with Frank Barron, Santa Cruz County Planning Department on March 10, 2005)	100.0%
CA-12A: Jetty Road to Aptos (272 acres)	Proposed for designation	Santa Cruz, Monterey	Medium	The Pajaro Dunes subdivision, adjacent to Palm State Beach, is nearly built-out, but may experience renovations on existing development. (Personal communication with Joan Vanderhoven, Santa Cruz County Planning Department on March 10, 2005)	21.0%
CA-16: Pismo Beach / Nipomo Dunes (1269 acres)	Proposed for designation	San Luis Obispo, Santa Barbara	San Luis Obispo: Medium Santa Barbara: Medium	San Luis Obispo: Oceano is a developing community, but is mostly built-out. There may be some residential re-development of this area, but no plans are currently proposed. Santa Barbara: There is some potential for recreational development, but nothing has been formally proposed in this area. (Personal communication with John Hand, San Luis Obispo County, Department of Planning and Building on March 31, 2005 and Jamie Goldstein, Santa Barbara County Planning and Development on March 9, 2005)	7.7%

Exhibit 5-3

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN CALIFORNIA

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
CA-18: Devereaux Beach (36 acres)	Proposed for designation	Santa Barbara	Medium	This potential unit is under three jurisdictions: University of California Santa Barbara, Santa Barbara County, and the City of Goleta. Future development is possible, though not within the habitat area, as construction on the dunes is prohibited. (Personal communication with Jamie Goldstein, Santa Barbara County Planning and Development on March 9, 2005)	33.3%
CA-2: Big Lagoon (280 acres)	Proposed for designation	Humboldt	Low	Unit is within Humboldt Lagoons State Park and the region is not subject to residential or commercial development. (Personal communication with Tom Hofweber, Humboldt County Planning Division on March 16, 2005)	6.1%
CA-3B: Mad River Mouth and Beach (377 acres)	Proposed for designation	Humboldt	Low	Units are in the area of Clam Beach and Mad River County Parks. This area is not subject to development pressure. (Personal communication with Tom Hofweber, Humboldt County Planning Division on March 16, 2005)	98.9%
CA-4A: Humboldt Bay; South Spit (374 acres)	Proposed for designation	Humboldt	Low	This unit is in the Humboldt Bay National Wildlife Refuge area, managed by the Bureau of Land Management (BLM) and not subject to development. (Personal communication with Tom Hofweber, Humboldt County Planning Division on March 16, 2005)	98.6%
CA-4D: Eel River Gravel Bars (1193 acres)	Proposed for designation	Humboldt	Low	A gravel mining operation exists within this potential unit; development is not likely. (Personal communication with Tom Hofweber, Humboldt County Planning Division on March 16, 2005)	100.0%
CA-5: MacKerricher Beach (1048 acres)	Proposed for designation	Mendocino	Low	This potential unit is within MacKerricher State Park; nearby areas are zoned for single-family homes but are not likely to impact the plover or habitat. (Personal communication with Rick Miller, Mendocino County Planning Division on March 10, 2005)	3.1%
CA-6: Manchester Beach (341 acres)	Proposed for designation	Mendocino	Low	The Manchester Beach State Park contains this potential unit. (Personal communication with Rick Miller, Mendocino County Planning Division on March 10, 2005)	1.1%

Exhibit 5-3

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN CALIFORNIA

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
CA-8: Point Reyes Beach (462 acres)	Proposed for designation	Marin	Low	These lands are within Point Reyes National Seashore and will not be developed. (Personal communication with Kristin Drumm, Marin County Planning Commission on March 9, 2005)	0.5%
CA-9: Limantour Spit (124 acres)	Proposed for designation	Marin	Low	These lands are within Point Reyes National Seashore and will not be developed. (Personal communication with Kristin Drumm, Marin County Planning Commission on March 9, 2005)	0.0%
San Francisco Bay (1847 acres)	Proposed for exclusion	Multiple	Low	The San Francisco Bay area salt ponds are not expected to be subject to development.	25.5%
CA-11A: Waddell Creek Beach (9 acres)	Identified for possible inclusion	Santa Cruz	Low	This potential unit is within Big Bend Redwoods State Park and is not subject to development. (Personal communication with Frank Barron, Santa Cruz County Planning Department on March 10, 2005)	38.6%
CA-11C: Wilder Creek Beach (10 acres)	Proposed for designation	Santa Cruz	Low	These lands are within Wilder Ranch State Park and are not subject to development. (Personal communication with Frank Barron, Santa Cruz County Planning Department on March 10, 2005)	1.4%
CA-12B: Elkhorn Slough Mudflat (281 acres)	Proposed for designation	Monterey	Low	This unit contains very few private lands and is not likely to be developed. No developments are anticipated here. (Personal communication with Bill Hopkins, Monterey County Planning and Building Inspection Department on March 21 and March 24, 2005)	4.9%
Salinas River National Wildlife Refuge (142 acres)	Proposed for exclusion	Monterey	Low	Salinas River National Wildlife Refuge will not be developed.	0.2%
CA-13: Point Sur Beach (61 acres)	Proposed for designation	Monterey	Low	This unit is in the area of Point Sur State Historic Park and is not expected to be subject to future development. (Personal communication with Bill Hopkins, Monterey County Planning and Building Inspection Department on March 21 and March 24, 2005)	81.4%

Exhibit 5-3

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN CALIFORNIA

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
CA-14: San Simeon Beach (28 acres)	Proposed for designation	San Luis Obispo	Low	This potential unit is in the region of San Simeon State Park and development is not expected.	11.1%
CA-15A: Villa Creek Beach (17 acres)	Proposed for designation	San Luis Obispo	Low	No possibility of development exists here. The area considered for designation is between Highway 1 and the coast and falls by the mouth of the creek. It is likely zoned agricultural and the policy in these areas is no development. (Personal communication with John Hand, San Luis Obispo County Department of Planning and Building on March 31, 2005)	0.0%
CA-15B: Atascadero Beach (144 acres)	Proposed for designation	San Luis Obispo	Low	This unit is in the area of Morro Strand State Beach. Three adjacent subdivisions (Beach Track, North Point, and Cloisters) are built-out and unlikely to be developed further. (Personal communication with Greg Cummings, City of Morro Bay Planning Department on April 4, 2005)	32.8%
CA-15C: Morro Bay Beach (611 acres)	Proposed for designation	San Luis Obispo	Low	The area is a sand spit on the west side of the Morro Bay and is used for recreation; no development is forecast. The spit is all sand, not amenable to structures. (Personal communication with John Hand, San Luis Obispo County Department of Planning and Building on March 31, 2005)	23.9%
Guadalupe / Nipomo Dunes National Wildlife Refuge (235 acres)	Proposed for exclusion	San Luis Obispo	Low	Lands within Guadalupe / Nipomo Dunes National Wildlife Refuge are not expected to experience development.	0.0%
CA-17A: Vandenberg Air Force Base North (626 acres)	Proposed for designation	Santa Barbara	Low	Vandenberg AFB will not experience development. Impacts on military lands are discussed in Section 6 of this report. (Personal communication with Jamie Goldstein, Santa Barbara County Planning and Development on March 9, 2005)	0.0%
CA-17B: Vandenberg Air Force Base South	Proposed for designation	Santa Barbara	Low	Vandenberg AFB will not experience development. Impacts on military lands are discussed in Section 6 of this report. (Personal communication with Jamie Goldstein, Santa Barbara County Planning and Development on March 9, 2005)	0.0%

Exhibit 5-3

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN CALIFORNIA

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
CA-19B: Ormond Beach (203 acres)	Proposed for designation	Ventura	Low	Land adjacent to city beach is zoned "coastal recreation" or "coastal resource protection." In addition, the California Coastal Conservancy owns much of the land. The area is not expected to experience development. (Personal communication with Sue Martin, City of Oxnard Planning and Environmental Services on March 14, 2005)	100.0%
CA-19C: Mugu Lagoon Beach, North (321 acres)	Proposed for designation	Ventura	Low	This area is within the Navy Air Warfare Center at Point Mugu and will not experience development. (Personal communication with Nancy Francis, Ventura County Planning Division on March 14, 2005; City of Oxnard Zoning Map)	2.1%
CA-19D: Mugu Lagoon Beach, South	Proposed for designation	Ventura	Low	This area is within the Navy Air Warfare Center at Point Mugu and will not experience development. (Personal communication with Nancy Francis, Ventura County Planning Division on March 14, 2005; City of Oxnard Zoning Map)	0.0%
CA-22A: Bolsa Chica Reserve (591 acres)	Proposed for designation	Orange	Low	This area is not expected to experience any development pressure. It is primarily a protected wetlands area, and it is near Bolsa Chica State Beach. (Personal communication with Ron Tippets, Orange County Environmental Planning Services on March 24, 2005)	100.0%
CA-22B: Huntington State Beach (13 acres)	Proposed for designation	Orange	Low	Bolsa Chica State Beach will not be developed. (Personal communication with Ron Tippets, Orange County Environmental Planning Services on March 24, 2005)	0.0%
CA-23: Santa Ana River Mouth (4 acres)	Proposed for designation	Orange	Low	This potential unit is within Huntington State Beach and is also a California Least Tern Natural Preserve. No development is anticipated. (Personal communication with Ron Tippets, Orange County Environmental Planning Services on March 24, 2005)	7.2%
CA-10: Half Moon Bay (37 acres)	Proposed for designation	San Mateo	Unknown	The county planning department could not be reached for comment.	0.0%

Exhibit 5-3

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN CALIFORNIA

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
CA-20: Zuma Beach (68 acres)	Proposed for designation	Los Angeles	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within Los Angeles County are primarily built out, and that these areas would not be subject to further development. Further, this area is within Zuma Beach County Park. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	11.2%
CA-21A: Santa Monica Beach (25 acres)	Proposed for designation	Los Angeles	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within Los Angeles County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	76.6%
CA-21B: Dockweiler, North (43 acres)	Proposed for designation	Los Angeles	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within Los Angeles County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	0.0%
CA-21C: Dockweiler, South (24 acres)	Proposed for designation	Los Angeles	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within Los Angeles County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	46.3%
CA-21D: Hermosa Beach (10 acres)	Proposed for designation	Los Angeles	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within Los Angeles County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	99.5%

Exhibit 5-3

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN CALIFORNIA

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
CA-24: San Onofre Beach (58 acres)	Proposed for designation	Orange, San Diego	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within San Diego County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	15.7%
Marine Corps Base Camp Pendleton (507 acres)	Proposed for exclusion	San Diego	Unknown	This area comprises military lands and is therefore not expected to be subject to real estate development.	0.0%
CA-25A: Batiquitos Lagoon, West (21 acres)	Proposed for designation	San Diego	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within San Diego County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	28.6%
CA-25B: Batiquitos Lagoon, Middle (23 acres)	Proposed for designation	San Diego	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within San Diego County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	35.0%
CA-25C: Batiquitos Lagoon, East (21 acres)	Proposed for designation	San Diego	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within San Diego County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	100.0%

Exhibit 5-3

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN CALIFORNIA

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
CA-26: Los Penasquitos Lagoon / Beach (24 acres)	Proposed for designation	San Diego	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within San Diego County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	1.8%
San Diego (Ocean Beach Park) (23 acres)	Proposed for exclusion	San Diego	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within San Diego County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	17.4%
CA-27A: North Island, North (117 acres)	Proposed for designation	San Diego	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within San Diego County are primarily built out, and that these areas would not be subject to development. Further, this is in the area of the North Island U.S. Naval Air Station. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	0.0%
CA-27B: North Island, South (68 acres)	Proposed for designation	San Diego	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within San Diego County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	0.0%
CA-27C: Silver Strand St. Beach (174 acres)	Proposed for designation	San Diego	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within San Diego County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	2.4%

Exhibit 5-3

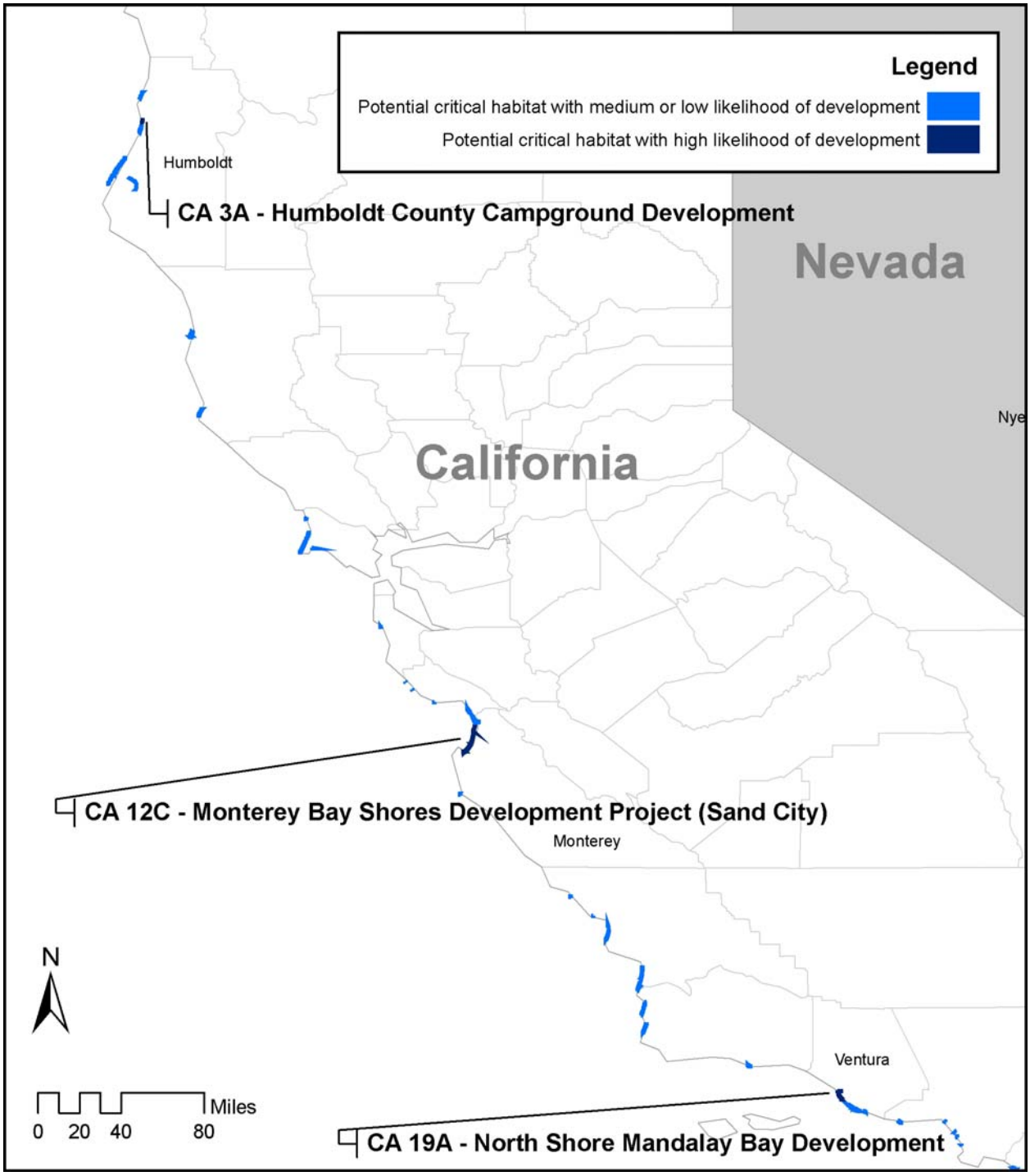
LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN CALIFORNIA

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
Naval Amphibious Base (144 acres)	Proposed for exclusion	San Diego	Unknown	This area comprises military lands and is therefore not expected to be subject to real estate development.	0.0%
CA-27D: Delta Beach (85 acres)	Proposed for designation	San Diego	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within San Diego County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	0.0%
CA-27E: Sweetwater National Wildlife Refuge (128 acres)	Proposed for designation	San Diego	Unknown	The county planning department could not be reached for comment. The CCC, however, anticipates that the coastline areas within San Diego County are primarily built out, and that these areas would not be subject to further development. (Personal communication with Larry Simone, California Coastal Commission, March 7, 2005)	40.1%
CA-27F: Tijuana River Beach (182 acres)	Proposed for designation	San Diego	Unknown	This unit is within the Imperial Beach Naval Air Station lands and is therefore not anticipated to be subject to real estate development.	11.9%

Notes: Land ownership is from information from GIS shape files provided by the U.S. Fish and Wildlife Service and may differ from the land ownership estimates in the proposed rule.

Exhibit 5-4

Distribution of Areas of High Development Potential in California



5.3.3 Units in California with High Development Potential

234. This section describes areas of proposed critical habitat in California that are most likely to experience residential or commercial real estate development. These include areas with planned or proposed development projects. As highlighted in Exhibit 5-4, development projects are anticipated within or adjacent to three potential critical habitat units: CA-3A (Clam Beach / Little River), CA-12C (Monterey to Moss Landing), and CA-19A (Mandalay Beach to Santa Clara River Mouth). While all three units are primarily located on State or county land, nearby private land has either been proposed or approved for development.

CA-3A: Clam Beach / Little River

235. Located in Humboldt County, potential Unit CA-3A includes portions of both Little River State Beach and Clam Beach County Park. Little River State Beach is currently zoned by the county for public recreation while Clam Beach County Park is zoned both for public recreation and natural resources.[169] Humboldt County Public Works is planning to formalize and improve the existing campgrounds within the County Park lands. The existing campground currently comprises simply a paved parking lot around which campers may park. The planned improvements to this area are in the early stages; however, the goal of the improvements is to allow more privacy to campers by creating separate "pull in" areas within which vehicles may park. Through these improvements, the county hopes to make the existing campsite more attractive, but not to expand capacity. Expansion of the campsite will not occur, specifically because of the presence of habitat for the plover.[170]

236. The campsite currently brings $30,000 per year in revenue to Humboldt County through per-vehicle charges for site use. The site is currently at capacity during busier summer months and could likely be expanded but for the presence of the plover. The county estimates that the campground could double its revenues if expansion were possible. This analysis therefore estimates that conservation efforts for the plover result in $30,000 per year (in constant dollars terms) from 2005 to 2025 in lost revenue for Humboldt County by limiting the capacity of the existing campgrounds.[171] The total impact of this lost revenue through 2025 is therefore $630,000 in constant dollars terms, which translates into a present value of $348,000 applying a seven percent discount rate or $476,000 applying a three percent discount rate.

237. A few private inholdings exist adjacent to the public beaches. These areas are zoned for residential estates, commercial recreation, public recreation, public facility, and

[169] Clam and Moonstone Beach County Parks Management Master Plan, prepared by Planwest Partners for Humboldt County Department of Public Works, March 2004, p. 4-1, accessed at http://www.co.humboldt.ca.us/portal/living/County_parks/default.asp?content=clamMoonstone.htm on March 27, 2005.

[170] Personal communication with Cheryl Dillingham, Humboldt County Public Works, April 4, 2005.

[171] Ibid.

residential ex-urban development.[172] A single private landowner has proposed construction of a Recreational Vehicle (RV) park adjacent to the potential critical habitat. The landowner has requested that the Humboldt County LCP be amended for this use.[173] This development was first proposed in the 1980s, but the landowner did not follow through with a formal proposal and environmental impact statement. The landowner contacted the Service with a letter dated June 21, 2004, and the Service responded with a letter received July 28, 2004 stating that the proposed project may result in take of the plover. The Service further noted that if the project were to require an incidental take permit, the landowner would need to develop an HCP associated with this project, but that typically such plans were expensive to develop and implement.[174]

238. It is unclear whether the landowner will continue to pursue this project and information is not currently available regarding the details of the potential project.[175] If the landowner does propose the development, (s)he may be burdened with the costs of developing an HCP, which may include efforts such as species surveys and purchase of mitigation lands or conservation easements.[176] If the landowner does not choose to propose this project, the associated economic impact may be any lost income to the landowner associated with fees for use of the RV park, and also potential indirect impacts to the regional economy of decreased potential to attract additional tourism.

CA-12C: Monterey to Moss Landing

239. The large-scale Monterey Bay Shores development project is planned within potential unit CA-12C in Sand City. The project area comprises 39.04 acres on the shoreline of Monterey Bay.[177] Sand City was incorporated in 1960. It was formerly a base for commercial and industrial needs in the Monterey area. In the 1970s, the sand mines slowed and the regional economy became depressed. The Sand City Redevelopment Agency was therefore created with the goal of shifting the economy of the region to a tourism-based economy through construction of hotels, condominiums, resorts and other service-based businesses. In the 1990s, there was disagreement among the developers, Sand City, and the State regarding how much of the coastline should be developed as opposed to preserved for wildlife. The result of negotiations was the development of a Memorandum of Understanding (MOU) known as the Coastal Peace Accord. Through this understanding, Sand City agreed to set aside 80 percent of the coastline for open space and habitat.[178] In turn, three areas would be subject to development: the McDonald Site, Sterling Site, and Lone Star (or Monterey Bay Shore)

[172] Clam and Moonstone Beach County Parks Management Master Plan, prepared by Planwest Partners for Humboldt County Department of Public Works, March 2004, p. 4-1, accessed at http://www.co.humboldt.ca.us/portal/living/county_parks/default.asp?content=clamMoonstone.htm on March 27, 2005.

[173] Personal communication with Tom Hofweber, Humboldt County Planning Division, March 17, 2005.

[174] Letter from U.S. Fish and Wildlife Service, Arcata Field Office, to Sam Stanson, July 28, 2004.

[175] Personal communication with Cheryl Dillingham, Humboldt County Public Works, April 4, 2005.

[176] Costs of developing HCPs for the plover are discussed in detail in Section 3 of this report.

[177] Zander Associates, *Draft Habitat Conservation Plan: Monterey Bay Shores Project, Sand City, California*, November 2000.

[178] Personal communication with Tom Roth, Attorney for Sand City.

Site. Development of these sites has not yet begun, although the plans for development are contained within the MOU.

240. Provisions within the MOU that may offer protection for the plover or habitat include the parties' commitment to:

- "Support efforts to restore sand dunes and associated dune vegetation and habitat;
- Create and preserve a north/south habitat corridor for endangered and threatened species; and
- Provide appropriate public open space, and beach and dune access."[179]

241. The City and developers anticipate that critical habitat for the plover in this area will result in additional restrictions by permitting agencies, including the CCC. As a result the City and developers are in the process of drafting an HCP for the project based on the MOU. Four drafts of the HCP have been submitted over the past eight years and the process was reinitiated in the Fall of 2004. The HCP considers the endangered Smith's blue butterfly and the threatened Monterey spineflower, in addition to the plover.

242. The November 2000 Draft HCP notes that the potential direct impact of the project on the plover and habitat is project grading and beach nourishment activities above the mean high tide line. These activities may modify areas of open sand that have provided nesting habitat for the plover in the past. To account for this, the HCP proposes to monitor and schedule the project to reduce the risk of take resulting from construction. "Indirect" impacts to the plover may result from loss of habitat area associated with development of open sand areas and increased human activities occurring on the beaches.[180] The Draft HCP proposes the following impact minimization and mitigation measures:

<u>"Minimization of impacts</u>

- Regulated use of 4 acres of existing beach known to have previously provided habitat for the western snowy plover.
- Preconstruction surveys for active breeding/nesting on the project site to avoid disturbance of nesting western snowy plover during the plover nesting season (March through August), if present.
- Establishment of a biological resource steward position to monitor western snowy plover activity and direct construction activities appropriately through consultation with the construction Site Superintendent.

[179] Monterey Peninsula Regional Park District, California State Parks, City of Sand City, and Sand City Redevelopment Agency, *Memorandum of Understanding Regarding Sand City Coastal Land Use*, April 8, 1996.

[180] Zander Associates, *Draft Habitat Conservation Plan: Monterey Bay Shores Project, Sand City, California*, November 2000, pp. 19-21.

Mitigation for impacts

- Expansion of beach and strand habitat in vicinity of project.
- Beach access restrictions during breeding/nesting season.
- Lighting restrictions for project facilities within and adjacent to western snowy plover habitat.
- Creation of minor dune topography in beach expansion area.
- Establishment of coastal strand vegetation.
- Permanent protection of 4 acres of existing habitat and 7 acres of created habitat for the western snowy plover.
- Establishment of a biological resource steward position specifically to monitor western snowy plover activity on the site and in the region."[181]

243. The direct costs of the HCP are the administrative costs of its development and the costs of implementing the outlined conservation activities. Sand City has spent an estimated $250,000 to $300,000 to develop the draft HCP; the Sand City Redevelopment Agency has spent an additional $50,000 to $100,000 for the same (in constant dollar terms).[182] Although the HCP considers multiple species, in the absence of information regarding which species drives the administrative cost of the plan's development, this analysis includes the full cost of the development, and acknowledges that the plover is only one of the driving factors behind this cost.

244. In addition to the administrative costs of development, the City agreed to purchase private lots for open space and habitat. The City recently spent between $3.5 and $4.0 million for the land purchase. Multiple factors contributed to the purchase of the land, including habitat consideration for the species covered in the HCP, including the plover, and for the preservation of open space in general. As information is not available to determine what percentage of this cost is attributable specifically to plover conservation, the full cost is presented with the caveat that it overstates costs associated with consideration of the plover and habitat.

245. The direct cost of plover conservation associated with the future implementation of the HCP is primarily the employment of full-time stewards to monitor human and plover interaction. This is expected to cost the City approximately $50,000 to $100,000 per year and is expected to continue from 2005 through 2025 (the life of the HCP is unknown).[183] The total impact through 2025 is therefore $1.05 million to $2.1 million in constant dollars terms, which translates into a present value of $580,000 to $1.16 million applying a seven percent discount rate or $794,000 to $1.59 million applying a three percent discount rate.

246. In addition to these direct costs, adjustments to the original development project contemplated in the 1970s and 1980s, specifically the decreased size of the project, may negatively impact the regional economy in limiting the increase in tourism that the

[181] Ibid., p. 40.
[182] Personal communication with Tom Roth, Attorney for Sand City, March 18, 2005.
[183] Ibid.

development will support.[184] It is unclear, however, to what extent these early changes in project planning were due to consideration of the plover and habitat as the project was controversial prior even to the listing of the plover.

CA-19A: Mandalay Beach to Santa Clara River Mouth

247. Unit CA-19A, located in Ventura County, includes portions of both McGrath and Mandalay State Beaches. Both beaches are within the City of Oxnard, and are zoned either coastal recreation or coastal resource protection.[185] The City recently approved a 300-unit subdivision approximately 0.5 miles east of CA-19A. Because this subdivision may encroach on habitat of the Ventura Marsh milk-vetch, the developer, North Shore, proposed a 28-acre mitigation area that is close to CA-19A and may therefore impact plover habitat. This 90-acre subdivision, North Shore at Mandalay Bay, is located east of Harbor Boulevard and north of West Fifth Street in the City of Oxnard.[186] Because the project proposes development of four acres occupied by the Ventura Marsh milk-vetch, the developers have proposed a 16-acre (four to one mitigation ratio) mitigation area to be turned into wetlands. It is unclear, however, whether this mitigation area project will be successful and it may also be harmful to nearby plover habitat. The Ventura Marsh milk-vetch mitigation area for North Shore Mandalay Bay is located west of Harbor Boulevard and south of Gonzales Road in unincorporated Ventura County.[187] The status of this 300 home development project is uncertain at this time. The proposed development is situated on a former waste-oil disposal site and the cleanup has hampered the development. The feasibility of the development and the mitigation area proposal will be subject to a hearing later this year.[188]

248. In addition to this known development project, several smaller parcels exist nearby that may be developed as single family homes. These projects, however, are remote enough that they are not expected to impact the plover or its habitat.[189]

5.3.4 Units in California with Medium Development Potential

249. This section describes areas of proposed critical habitat in California that may experience residential or commercial real estate development, although no current development plans, proposals, or projections exist. As highlighted in Exhibit 5-3, development is of medium potential within or adjacent to eight of the potential units in the State. In the case that development occurs in these areas in the future, plover habitat could be affected by the projects. As specific plans for development do not exist, however, it is not possible to determine the potential direct and indirect impacts to the projects as a result of undertaking plover conservation efforts.

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[184] Ibid.

[185] City of Oxnard, City of Oxnard Zoning Map created January 19, 2005.

[186] Personal communication with Sue Martin, City of Oxnard Planning and Environmental Services, on March 16, 2005.

[187] Personal communication with Liz Chattin, Ventura County Planning, on March 10, 2005.

[188] Personal communication with Sue Martin, Oxnard Planning and Environmental Services, March 16, 2005.

[189] Ibid.

CA-1: Lake Earl

250. Unit CA-1 is located in Del Norte County. This area is primarily (87 percent) private land but also includes county and State lands. There have been several attempts to develop this area, but development is not likely to occur for multiple reasons unrelated to the plover. Primarily, the water table is very high in this area, precluding use of conventional septic systems. In addition, the Pacific Shores Homeowners Association in this area has proposed residential development; the proposal is not likely to be approved by the California Coastal Commission (CCC) or the county because no LCP has been developed for the area.[190]

CA-4B: Eel River; North Spit and Beach

251. Unit CA-4B is located in Humboldt County. The majority of the potential unit is within the Eel River Wildlife Area managed by California Department of Fish and Game. Lighthouse Ranch, north of the Eel River Wildlife Area, however, is privately owned and may be developed in the future. The area is a few hundred feet above the beach and is not anticipated to impact the plover or habitat.[191]

CA-4C: Eel River; South Spit and Beach

252. Unit CA-4C is located in Humboldt County. The area is primarily (97 percent) private lands. The lands within and adjacent to the beach are zoned for natural resource protection, public recreation, and agricultural use. Bottomland Farms owns most of this land. Development is possible, but not likely, in the private lands within and adjacent to unit CA-4C.[192]

CA-7: Dillon Beach

253. Unit CA-7 in Marin County contains Dillon Beach Resort. This private beach attracts visitors for multiple types of recreation as discussed in Section 4 of this report. This area is chiefly (92 percent) private lands. The Lawson's Landing area of this unit is zoned for coastal, recreational, and commercial development. Further, the county encourages visitor services within this area to attract tourism and recreational use of the area.[193]

254. While no specific development plans exist within the potential critical habitat, the resort owners and visitors to Dillon Beach have expressed concern that the critical habitat for the plover will burden future developers through increased permit restrictions and that these restrictions will make development of this area less attractive. There is further concern that decreased development will negatively impact the tourism business in

[190] Personal communication with Ernie Perry, Del Norte County Planning Department on March 22, 2005.
[191] Personal communication with Tom Hofweber, Humboldt County Planning Division on March 17, 2005.
[192] Ibid.
[193] Personal communication with Kristen Drumm, Marin County Planning Department, March 9, 2005.

particular, and the regional economy in general, at Dillon Beach.[194] However, the Dillon Beach area was designated as critical habitat for the plover in 1999. Since that time, Marin County has not experienced impacts to development projects associated with plover conservation efforts.[195]

CA-11B: Scott Creek Beach

255. Unit CA-11B, located in Santa Cruz County, is located at Scott Creek State Beach, and development in the surrounding area is limited. Although no current development plans exist, development is possible within the adjacent, privately owned lands.[196]

CA-12A: Jetty Road to Aptos

256. Unit CA-12A is located in Santa Cruz and Monterey Counties. The Pajaro Dunes subdivision in Santa Cruz County is nearby, adjacent to Palm State Beach and CA-12A. Beach Drive provides access to the State beach; north of Beach Drive, 300 condominium units exist and lands south of Beach Drive support an additional 262 condominium units and single-family homes. The subdivision is nearly completely built out. It is estimated that only one lot remains to be developed. As these lots were developed in the 1970s, however, renovations are likely to occur.[197] The south portion of CA-12A in Monterey County is not likely to experience future development.

CA-16: Pismo Beach / Nipomo Dunes

257. The San Luis Obispo County portion of potential unit CA-16 may be subject to some development pressure. Oceano is a nearby community that is mostly built out. However, some low-level residential or re-development is possible.[198] The portion of CA-16 within Santa Barbara County is not expected to experience residential development due to the proximity to Vandenberg Air Force Base. Recreation does occur in this area, however, and there is the potential for construction of an informational kiosk for recreators, or for a refreshment stand. Specific plans, however, do not currently exist and potential impact to the plover or habitat is therefore unclear.[199]

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[194] Personal communication with Tom Roth, Attorney for Dillon Beach Resort, March 18, 2005.

[195] Personal communication with Kristin Drumm, Marin County Planning Commission on March 9, 2005.

[196] Personal communication with Frank Barron, Santa Cruz County Planning Department, on March 10, 2005.

[197] Personal communication with Joan van der Hoven, Santa Cruz County Planning Department, on March 10, 2005.

[198] Personal communication with John Hand, San Luis Obispo County, Department of Planning and Building, on March 31, 2005.

[199] Personal communication with Jamie Goldstein, County of Santa Barbara Planning and Development, on March 16, 2005.

CA-18: Devereaux Beach

258. Unit CA-18 falls under three separate jurisdictions: The University of California, Santa Barbara County, and the City of Goleta. The entities are currently at work on a long-term master plan to relocate development away from the beach. Development is already not permitted within the dunes or within roughly 100 feet of the coast. The City of Goleta, however, is within 0.5 miles of the coast and may develop 1,000 to 2,000 additional housing units within its jurisdiction.[200] As no specific plans are available, however, it is uncertain whether development this far from the potential habitat would be impacted by plover conservation efforts.

5.3.5 Units in California with Low or Unknown Development Potential

259. Of the remaining potential critical habitat units in California, 27 are characterized as having low development potential as described in Exhibit 5-3. Specifically these areas are not likely to experience residential or commercial real estate development because of the following:

- *The potential critical habitat areas are within or adjacent to a State Park:* CA-2, CA-5, CA-6, CA-11A, CA-11C, CA-13, CA-14, CA-15B, CA-22B, CA-23, San Francisco Bay;

- *The potential critical habitat areas are within or adjacent to a county park:* CA-3B;

- *The potential critical habitat areas are within or adjacent to a National Wildlife Refuge:* CA-4A, CA-8, CA-9, Salinas NWR, and Guadalupe/Nipomo Dunes NWR;

- *The potential critical habitat areas are within or adjacent to military lands:* CA-17A, CA-17B, CA-19C, and CA-19D; and

- *Other (e.g., proximity to gravel mining operations or not geologically conducive to development):* CA-4D, CA-12B, CA-15A, CA-15C, CA-19B, and CA-22A.

260. In addition, there is insufficient information to determine development activity in 21 units. These potential units fall within three California counties: San Mateo, Los Angeles, and San Diego. The county planning departments could not be reached for comment. According to the CCC, however, plover habitat areas along the coasts of San Diego and Los Angeles Counties are likely already built out and redevelopment or renovation of developments are exempt from county LCP permitting requirements as described in Section 5.3.1.[201]

[200] Ibid.
[201] Personal communication with Larry Simone, California Coastal Commission, March 7, 2005.

5.4 Development in Potential Critical Habitat in Oregon

5.4.1 Oregon: Regulation of Development

261. The Oregon Department of Land Conservation and Development, under the authority of the Land Conservation and Development Commission, adopted statewide planning goals and guidelines in 1974. These statewide goals are accomplished though local planning. Specifically, each county and city in Oregon follows a "comprehensive plan" enforced by the corresponding zoning and land use ordinances. These comprehensive plans are regularly reviewed by the State Department of Land Conservation and Development for consistency with the statewide planning goals.[202] Related to the plover, Goal 18 directs local governments to protect areas of critical environmental concern, areas of scenic, scientific, or biological importance, and areas with significant wildlife habitat.[203] These resources are therefore taken into consideration when the counties and cities review permit applications for development projects.

262. The Oregon Parks and Recreation Department Planning Division is currently developing two parallel plans to regulate coastal areas within the State: the Ocean Shores Management Plan and the HCP for the Western Snowy Plover. The most recent draft of the former, from November 2004, provides a "broad framework of focus areas and recommendations regarding all aspects of the department's management responsibilities for the Ocean Shore, and will be consistent with the Habitat Conservation Plan."[204] The three primary goals of this plan are to:

1. Strike a balance between resource protection and recreational use;

2. Provide for the public's enjoyment, understanding and well being; and

3. Collaborate with the local community and larger area.[205]

263. The Oregon HCP for the plover, as described in Section 3 of this report, guides recreation management, ocean shore permits, miscellaneous use permits, drive-on-beach permits, beach logging and salvage permits, scientific research and collection permits, all-terrain vehicle/off-highway vehicle (ATV/OHV) permits, beach management activities, and natural resource management. The HCP highlights beach development, including shoreline protection structures, homes, hotels, parking lots, access roads, and recreational facilities, as a threat to plover habitat. The threat stemming from these activities is primarily indirect, resulting from increased human disturbance on the beach,

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[202] Oregon Department of Land Conservation and Development, Statewide Planning Goals, accessed at http://www.lcd.state.or.us/LCD/goals/shtml on April 5, 2005.

[203] Oregon Parks and Recreation Department, *Draft Habitat Conservation Plan for the Western Snowy Plover*, 2004, p. 17.

[204] Oregon Parks and Recreation Department, *Draft Ocean Shore Management Plan*, November 2004, p. 9.

[205] Ibid., pp. 22-24.

increased light and sound levels that make habitat less attractive to the plover, increased pollution, and attraction of plover predators.[206]

264. Many of the plover management areas outlined in the HCP are located in isolated areas where little or no development exists. In the case that developable private property is near plover habitat, however, the chance that the Oregon Parks and Recreation Department will issue a permit is low.[207]

5.4.2 Oregon: Distribution of Development

265. Exhibit 5-5 specifies the development potential of each potential unit of critical habitat in Oregon. Areas of high development potential are highlighted in Exhibit 5-6. Specific development projects in these areas are detailed in Section 5.4.3.

[206] Oregon Parks and Recreation Department, *Draft Habitat Conservation Plan for the Western Snowy Plover*, 2004, p. 55.

[207] Ibid., p. 104.

Exhibit 5-5

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN OREGON

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
OR-3: Bayocean Spit (207 acres)	Proposed for designation	Tillamook	High	This spit formerly supported a resort in the early 1900s. The jetties broke apart and caused breaches in the spit that wiped away development. While re-development of the area is not likely (due to flood hazard), the U.S. Army Corps of Engineers (USACE) plans to restore the existing jetty system at the tip of the spit as described in Section 5.4.3. (Personal communication with Lisa Phipps, Tillamook County Planning Department, March 30, 2005 and Laura Hicks, USACE on April 5, 2005)	0.0%
OR-9: Coos Bay North Spit (278 acres)	Proposed for designation	Coos	High	Maintenance of the jetty that regulates water levels on the bay is undertaken by the USACE approximately every ten years as described in Section 5.4.3. (Personal communication with John Griffith, Coos County Commissioner, April 5, 2005)	0.0%
OR-5B: Sand Lake South (104 acres)	Identified for possible inclusion	Tillamook	Medium	A single individual owns this unit. A past project for a golf course was not approved and has not yet been re-proposed. The landowner may propose a similar project in the future as described in Section 5.4.4. (Personal communication with Lisa Phipps, Tillamook County Planning Department, March 30, 2005)	100.0%
OR-10A: Bandon / Floras Lake (680 acres)	Proposed for designation	Coos, Curry	Coos: Medium Curry: Low	Coos: Development may occur on private lands adjacent to the habitat area. (Personal communication with John Griffith, Coos County Commissioner, April 5, 2005) Curry: The river runs along the coast in this unit; therefore, development is set back a distance from the coast and does not impact the plover or habitat. (Personal communication with Kathy Blansett, Curry County, OR Planning, Building and Sanitation, April 1, 2005)	24.0%

Exhibit 5-5

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN OREGON

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
OR-1A: Columbia River Spit (65 acres)	Identified for possible inclusion	Clatsop	Low	This potential unit is within Fort Stevens State Park. No development is anticipated to occur in this area. (Personal communication with Kathleen Sellman, Clatsop County Community Development, March 31, 2005)	0.0%
OR-1B: Necanicum River Spit (78 acres)	Identified for possible inclusion	Clatsop	Low	This area will not be developed. Homes are established at a distance from the coast and there will be no westward expansion. (Personal communication with Dennis McNally, City of Gearhart Planning Department, April 4, 2005)	0.0%
OR-2: Nehalem River Spit (145 acres)	Identified for possible inclusion	Tillamook	Low	This unit is within Nehalem Bay State Park; development is not an issue. (Personal communication with Lisa Phipps, Tillamook County Planning Department, March 30, 2005)	0.0%
OR-4: Netarts Spit (143 acres)	Identified for possible inclusion	Tillamook	Low	This unit is within Cape Lookout State Park; development is not an issue. (Personal communication with Lisa Phipps, Tillamook County Planning Department, March 30, 2005)	0.0%
OR-5A: Sand Lake North (38 acres)	Identified for possible inclusion	Tillamook	Low	This area is adjacent to Sand Lake Recreation areas and is open to ATV use. No development plans exist. (Personal communication with Lisa Phipps, Tillamook County Planning Department, March 30, 2005)	0.0%
OR-6: Nestucca River Spit (147 acres)	Identified for possible inclusion	Tillamook	Low	This potential unit is part of Nestucca Spit State Park; development is not an issue. (Personal communication with Lisa Phipps, Tillamook County Planning Department, March 30, 2005)	0.0%
OR-7: Sutton / Baker Beaches (260 acres)	Proposed for designation	Lane	Low	It is unlikely development would occur in or adjacent to this potential unit as it is a recreational area. (Personal communication with Peter Thurston, Lane County Community and Economic Development March 31, 2005)	0.0%
OR-8A: Siltcoos River Spit (188 acres)	Proposed for designation	Lane, Douglas	Low	It is unlikely development would occur in or adjacent to this potential unit as it is a recreational area. (Personal communication with Peter Thurston, Lane County Community and Economic Development March 31, 2005)	0.0%

Exhibit 5-5

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN OREGON

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
OR-8D: Tenmile Creek Spit (235 acres)	Proposed for designation	Coos	Low	This area is Forest Service land and will not be developed. (Personal communication with John Griffith, Coos County Commissioner, April 5, 2005)	0.0%
OR-10B: Sixes River Spit (73 acres)	Identified for possible inclusion	Curry	Low	This potential unit is in Cape Blanco State Park. One private landowner holds land in the area, but is likely to leave the land in its current state. (Personal communication with Kathy Blansett, Curry County, OR Planning, Building and Sanitation, April 1, 2005)	0.0%
OR-10C: Elk River Spit (88 acres)	Identified for possible inclusion	Curry	Low	The Elk River runs along the coast in this area. Riparian protections, outside the scope of plover and habitat considerations, would prevent this area and adjacent lands from being developed. (Personal communication with Kathy Blansett, Curry County, OR Planning, Building and Sanitation, April 1, 2005)	100.0%
OR-11: Euchre Creek Spit (75 acres)	Identified for possible inclusion	Curry	Low	Euchre Creek runs along the coast in this area. Riparian protections, outside the scope of plover and habitat considerations, would prevent this area and lands adjacent from being developed. (Personal communication with Kathy Blansett, Curry County, OR Planning, Building and Sanitation, April 1, 2005)	100.0%
OR-12: Pistol River Spit (116 acres)	Identified for possible inclusion	Curry	Low	This area is within Pistol River State Park and will not be developed. (Personal communication with Kathy Blansett, Curry County, OR Planning, Building and Sanitation, April 1, 2005)	0.0%
OR-8B: Dunes Overlook / Tahkenitch Creek Spit (375 acres)	Proposed for designation	Douglas	Unknown	This potential unit lies in the area of Siuslaw National Forest and is therefore unlikely to experience significant development pressure.	0.0%

Exhibit 5-5

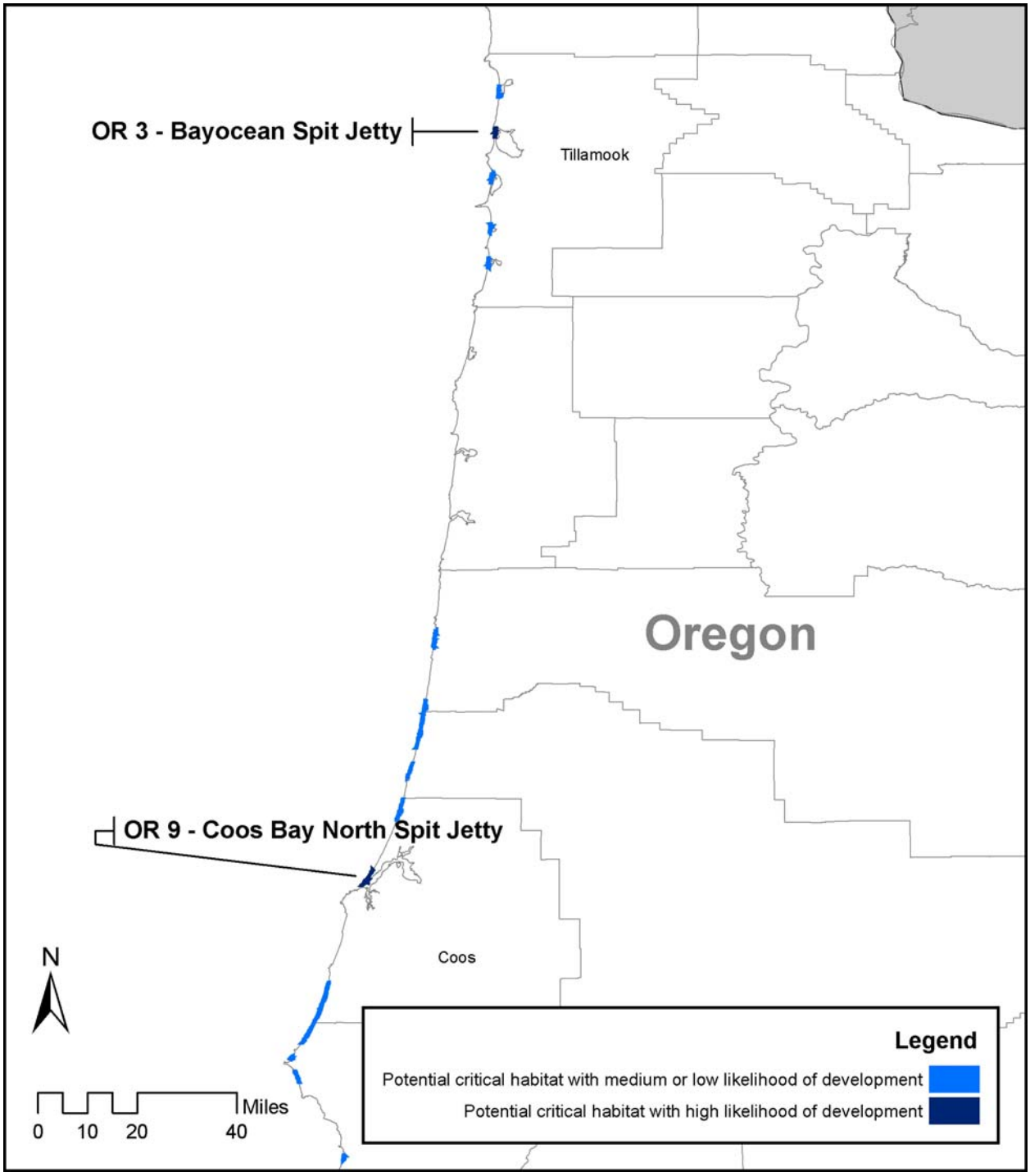
LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN OREGON

Potential Critical Habitat Unit	Proposed Rule Status	County	Development Potential	Notes	Private Lands as a Percent of Potential Critical Habitat Unit or Area
OR-8C: North Umpqua River Spit (111 acres)	Identified for possible inclusion	Douglas	Unknown	This potential unit is in the Siuslaw National Forest and is therefore unlikely to experience significant development pressure.	0.0%

Notes: Land ownership is from information from GIS shape files provided by the U.S. Fish and Wildlife Service and may differ from the land ownership estimates in the proposed rule.

Exhibit 5-6

Distribution of Areas of High Development Potential in Oregon



5.4.3 Units in Oregon with High Development Potential

266. This section describes areas of proposed critical habitat in Oregon that are most likely to experience residential or commercial real estate development. These include areas with planned or proposed development projects. As highlighted in Exhibit 5-6, development projects are anticipated within or adjacent to two of the potential critical habitat units: OR-3 (Bayocean Spit) and OR-9 (Coos Bay North Spit). Each of these two units is anticipated to be subject to jetty maintenance or construction projects in the future.

Unit OR-3: Bayocean Spit

267. Unit OR-3 in Tillamook County is zoned for recreation and currently supports boating and equestrian activities. In the early 1900s, the area supported a large resort, the Bayocean Spit Resort. The collapse of the jetties, however, caused a breach in the spit that wiped out the development. One individual has contemplated re-developing the resort in the past. This project is not likely to be pursued, however, because the spit is still an active flood hazard area and is not amendable to support of infrastructure.[208]

268. The existing jetties at the tip of the spit have lost several hundred feet due to natural ocean movement. These jetties exist to stabilize the entry channel to the bay. The USACE therefore plans to restore the length of the jetties. As part of this project, the USACE added a revetment (a rubble mound structure along the coastline) on the shore opposite the spit. Section 7 consultation regarding the plover was undertaken as part of this effort, but no modification to the projects was considered necessary.

269. Dependent on Congressional funding, the USACE plans to begin restoration of the jetty system in 2006. At that time, consultation will be re-initiated with the Service regarding the construction activity. Transport of materials through the habitat area may affect the plover habitat. It is unclear, however, whether this project may be modified to implement plover conservation efforts.[209]

Unit OR-9: Coos Bay North Spit

270. Unit OR-9, in Coos County, is bordered on the west by the Pacific and on the East by Coos Bay. The USACE maintains a jetty on the spit to control the depth of the navigation channel. Cargo ships regularly use this transportation corridor. Approximately every ten years, the jetty requires maintenance to repair holes or breaches created by the movement of the ocean. USACE uses trucks to transport boulders for jetty repair. In the past, the Service has expressed concern that jetty maintenance activities may negatively impact the plover or habitat area.

271. Approximately two years ago, the Service requested modification to the methods of jetty repair that would increase the cost to the USACE. For example, the Service

[208] Personal communication with Lisa Phipps, Tillamook County Planning Department, March 30, 2005.
[209] Personal communication with Laura Hicks, USACE, April 5, 2005.

requested implementing project windows and drawing alternate trucking routes to decrease habitat impacts. The USACE, however, declared the jetty repair project an emergency, and was allowed to proceed without modification for plover conservation. Accordingly past economic impacts to activities are not estimated for this project.

272. The county and USACE, however, expressed concern that the Service may request similar modifications to jetty maintenance in the future, or that maintenance of the jetty will be not allowed.[210] As modification to the project has not occurred in the past, however, information is not available on the potential future economic impact of implementing plover conservation efforts.

5.4.4 Units in Oregon with Medium Development Potential

273. This section describes areas of proposed critical habitat in Oregon that may experience residential or commercial real estate development, although no current development plans, proposals, or projections exist. As highlighted in Exhibit 5-5, development is of medium potential within or adjacent to two potential units in the State. In the case that development occurs in these areas in the future, plover habitat could be affected by the projects. As specific plans for development do not exist, however, it is not possible to determine the potential direct and indirect impacts to the projects as a result of undertaking plover conservation efforts. The following potential critical habitat units have a medium likelihood of development.

<u>Unit OR-5B: Sand Lake South</u>

274. Unit OR-5B in Tillamook County is privately owned by a single individual. Plans have been proposed in the past for a golf course at the top of the southern spit. One of the holes of the golf course was proposed to be located on the open beach sands. This project has not passed review, however. The county requested re-design of the proposal to move the hole in and minimize beach traffic. It is possible that the property owner may attempt to re-tool the project and re-propose in the future. Further, substantial opposition exists to constructing a golf course here due to the presence of Sand Lake, an estuarine natural area, and a State park to the north.[211]

<u>Unit OR-10A: Bandon/Floras Lake</u>

275. Unit OR-10A is split between Coos and Curry Counties. Lands east of the Coos County portion of the potential critical habitat may be subject to some level of development pressure. Private homes exist in this area and associated private projects, such as driveway construction, may require a Clean Water Act 404 permit from the USACE. In this case, the county is concerned that permits will be denied or projects will be modified to become cost-prohibitive due to the proximity of the area to the plover and

[210] Personal communication with John Griffith, Coos County Commissioner, April 5, 2004.
[211] Personal communication with Lisa Phipps, Tillamook County Planning Department, March 30, 2005.

potential critical habitat.[212] The Curry County portion of this area is not expected to experience development.[213]

5.4.5 Units in Oregon with Low or Unknown Development Potential

276. Of the remaining potential critical habitat units in Oregon, 13 are characterized as subject to low development potential as described in Exhibit 5-7. Specifically these areas are not likely to experience residential or commercial real estate development for the following reasons:

- *The potential critical habitat areas are within or adjacent to a State Park:* OR-1A, OR-2, OR-4, OR-6, OR-10B, and OR-12;

- *The potential critical habitat areas are within or adjacent to Forest Service land:* OR-8D;

- *Other (e.g., proximity to recreational areas or not geologically conducive to development):* OR-1B, OR-5A, OR-7, OR-8A, OR-10C, and OR-11.

277. In addition, there is insufficient information to determine development activity in two units. These potential units fall within Douglas County. Both potential units, however, are located within the area of Siuslaw National Forest and are therefore not likely to experience significant development pressure.

5.5 <u>Development in Potential Critical Habitat in Washington</u>

5.5.1 Washington: Regulation of Development

278. The Washington Department of Ecology is charged with enforcing the State's Shoreline Management Act (SMA). The SMA gives county and city governments primary authority over permitting projects in coastal areas, although the State has the authority to review these decisions. Each local government is required to develop a shoreline master program outlining plans for how shorelines will be used and developed. Each local government in the State reviews permits for "substantial development," defined as projects costing over $2,500 or those which materially interfere with the public's use of the waters. Activities that are exempt from permitting are single family residences and associated structures (such as docks), normal farming activities, and emergency construction.[214]

279. The Washington Department of Ecology Shoreline Master Program (SMP) Guidelines (the guidelines) outline standards for county and city governments to apply in

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[212] Personal communication with John Griffith, Coos County Commissioner, April 5, 2005.

[213] Personal communication with Kathy Blansett, Curry County, OR Planning, Building and Sanitation, April 1, 2005.

[214] Washington Department of Ecology, *Introduction to Washington's Shoreline Management Act (RCW 90.58*), Ecology Publication, pp. 99-113, December 1999.

their respective "master programs." With regard to development of private lands, the guidelines state the following:

- "The legislature further finds that much of the shorelines of the state and the uplands adjacent thereto are in private ownership; …and, therefore coordinated planning is necessary …while, at the same time recognizing and protecting private rights consistent with the public interest."

- "Each master program shall contain standards governing the protection of single family residences and appurtenant structures against damage or loss to shoreline erosion."[215]

280. While protecting private property rights, master programs are developed to assure that no net loss of shoreline ecological functions will result from residential development. Accordingly, master programs may specify regulations for setbacks, buffer areas, density, shoreline armoring, vegetation conservation requirements, or on-site sewage systems. In general, master programs should specify that residential development occur far enough away from the shoreline so as not to require stabilization structures.[216]

281. Further, the guidelines prohibit "non-water-oriented" commercial development along shorelines unless these developments may create a significant public benefit consistent with the objectives of the master program.[217]

5.5.2 Washington: Distribution of Development

282. Exhibit 5-7 specifies the development potential of each potential unit of critical habitat in Washington.

5.5.3 Units in Washington with High Development Potential

283. As highlighted in Exhibit 5-7, none of the potential critical habitat areas in Washington is identified as having high development potential. The entire potential critical habitat area falls within two counties, Grays Harbor and Pacific. These counties have not experienced impacts to development projects associated with plover conservation in the past and currently no proposals exist for development projects in these areas.[218]

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[215] Washington Administrative Code, *Washington State Shoreline Master Program Guidelines*, Chapter 173-26: p. 10.

[216] Ibid., p. 90.

[217] Ibid., p. 85.

[218] Personal communication with Brian Shea, Grays Harbor County, Department of Public Service, Planning Division, March 30, 2005 and Mike Desimone, Pacific County Department of Community Development, March 30, 2005.

Exhibit 5-7

LIKELIHOOD OF DEVELOPMENT IN POTENTIAL CRITICAL HABITAT UNITS IN WASHINGTON

Potential critical habitat Unit	**Proposed Rule Status**	**County**	**Development Potential**	**Notes**	**Private Lands as a Percent of Potential Critical Habitat Unit or Area**
WA-1: Copalis Spit (446 acres)	Identified for possible inclusion	Grays Harbor	Medium	Development of single family residences is a possibility. (Personal communication with Brian Shea, Grays Harbor County, Department of Public Service, Planning Division, March 30, 2005)	16.4%
WA-2: Damon Point / Oyhut Wildlife Area (908 acres)	Proposed for designation	Grays Harbor	Medium	Development of single family residences is a possibility. (Personal communication with Brian Shea, Grays Harbor County, Department of Public Service, Planning Division, March 30, 2005)	26.9%
WA-3: Midway Beach (786 acres)	Proposed for designation	Pacific	Medium	There may be some development adjacent to the beach in this potential unit. (Personal communication with Mike Desimone, Pacific County Department of Community Development, March 30, 2005)	8.9%
WA-4: Leadbetter Point / Gunpowder Sands (1069 acres)	Proposed for designation	Pacific	Low	The majority of this potential unit is in Leadbetter Point State Park and Wildlife Refuge. No development potential exists in this area. (Personal communication with Mike Desimone, Pacific County Department of Community Development, March 30, 2005)	5.1%

Notes: Land ownership is from information from GIS shape files provided by the U.S. Fish and Wildlife Service and may differ from the land ownership estimates in the proposed rule.

5.5.4 Units in Washington with Medium Development Potential

284. As highlighted in Exhibit 5-7, development is of medium potential within or adjacent to three of the potential critical habitat units in the State. In the case that development occurs in these areas in the future, plover habitat could be affected by the projects. As specific plans for development do not exist, however, it is not possible to determine the potential direct and indirect impacts to the projects as a result of undertaking plover conservation efforts. The following potential critical habitat units have a medium likelihood of development.

Unit WA-1: Copalis Spit

285. The lands adjacent to potential unit WA-1 are experiencing between two and three percent growth in development. This trend is expected to continue through the foreseeable future. Development of single family residences is therefore a possibility. No planned developments exist within this area, however. In the case of a proposed development project adjacent to potential critical habitat areas, it is unclear what type of project modification may be requested to provide for the plover and habitat.[219]

Unit WA-2: Damon Point/Oyhut Wildlife Area

286. Unit WA-2, similar to WA-1, lies within an area experiencing between two and three percent growth that is expected to continue in the foreseeable future. Development of single family residence is a possibility in this area, although no plans for development currently exist.[220]

Unit WA-3: Midway Beach

287. Unit WA-3 is a combination of State and private lands. Some private development projects may occur adjacent to the potential critical habitat, set back from the beach. The development itself is unlikely to be a direct threat to the plover or habitat. The main concern with increased development is the potential increased use of the beach, including for activities such as dog walking.[221]

5.5.5 Units in Washington with Low or Unknown Development Potential

288. Unit WA-4 in Pacific County is not expected to be subject to development pressure as this area falls within Leadbetter Point State Park and Wildlife Refuge.[222]

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[219] Personal communication with Brian Shea, Grays Harbor County, Department of Public Service, Planning Division, March 30, 2005.

[220] Ibid.

[221] Personal communication with Mike Desimone, Pacific County Department of Community Development, March 30, 2005.

[222] Ibid.

POTENTIAL ECONOMIC IMPACTS TO MILITARY FACILITIES AND MINING OPERATIONS SECTION 6

289. This section describes impacts of plover conservation on gravel mining and military activities and provides information on potential future impacts.[223] In general, the impacts to these activities include section 7 consultation and related project modifications such as surveying and monitoring. Future conservation efforts are expected to be similar, although the critical habitat designation may increase impacts slightly due to additional consultation requirements. *Note that this analysis does not attempt to quantify the impact to military readiness that may result from plover conservation efforts.*

6.1 Summary of Impacts

290. This analysis identifies past and future impacts of plover management undertaken by the military and gravel mine operators. Key findings of the analysis are:

- Impacts to military installations are primarily the result of monitoring, predator management, and habitat enhancement projects. With the exception of habitat enhancement projects, these costs reflect the ongoing expenses incurred by these facilities for the management programs outlined in the Integrated Natural Resource Management Plans (INRMPs). That is, the military is already undertaking monitoring and predator management activities for the benefit of the plover and its habitat.

- Impacts to gravel mining relate primarily to annual monitoring and reporting requirements stipulated in the Letter of Permission (LOP), which authorizes the U.S. Army Corps of Engineers to issue gravel extraction permits to mining companies. The LOP also places time constraints on gravel mining during the nesting season. These restrictions have the potential to affect operating costs by forcing operators to extract their annual haul in a shorter period of time. To date, however, plover-related restrictions have not significantly delayed mining activities.

[223] This analysis focuses on the impacts of plover conservation measures on activities that take place within the boundaries of the proposed critical habitat designation. The consultation history indicates that the Service has reviewed the impacts of dredging and oil and gas activities on plover. These historical activities, however, are outside the boundaries of the proposed critical habitat. This analysis therefore does not estimate impacts to these activities.

291. Exhibit 6-1 summarizes the past impacts of plover conservation efforts from the time the species was listed through the final CHD. Exhibit 6-2 summarizes the estimated future impacts of plover conservation efforts from 2005 through 2025. Annualized costs by unit are presented in Appendices F and G.

Exhibit 6-1

SUMMARY OF PAST IMPACTS ASSOCIATED WITH MILITARY AND GRAVEL MINING ACTIVITIES

CHD Unit	Unadjusted Past Impacts	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)
Gravel Mining			
CA 4D Eel River Gravel Bar	**$45,000 - $450,000**	**$52,000 - $523,000**	**$64,000 - $641,000**
Military Installations - Proposed for Designation			
CA 17A Vandenberg AFB, North	$2,694,000	$3,037,000	$3,584,000
CA 17B Vandenberg AFB, South	$1,308,000	$1,475,000	$1,741,000
CA 19C Mugu Lagoon, North	$215,000 - $260,000	$242,000 - $291,000	$283,000 - $338,000
CA 19D Mugu Lagoon, South	$46,000 - $55,700	$52,00 - $62,000	$61,000 - $72,000
CA 24 San Onofre Beach (Camp Pendleton)	$0	$0	$0
CA 27A North Island North/ Coronado	$452,000	$546,000	$708,000
CA 27B North Island/Coronado	$264,000	$319,000	$414,000
CA 27C Silver Strand	$291,000	$351,000	$455,000
CA 27D Delta Beach	$329,000	$398,000	$515,000
CA 27F Tijuana River Beach	$5,000	$7,000	$9,000
Subtotal	**$5,605,000 - $5,660,000**	**$6,427,000 - $6,487,000**	**$7,768,000 - $7,836,000**
Military Installations - Proposed for Exclusion			
Marine Corps Base Camp Pendleton	$944,000	$1,111,000	$1,396,000
Naval Amphibious Base	$558,000	$674,000	$873,000
Subtotal	**$1,502,000**	**$1,785,000**	**$2,269,000**

Notes:
Totals may not sum due to rounding.

Exhibit 6-2

SUMMARY OF FUTURE IMPACTS ASSOCIATED WITH MILITARY AND GRAVEL MINING ACTIVITIES

CHD Unit	Constant Dollars	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)
Gravel Mining			
CA 4D Eel River Gravel Bar	**$105,000 - $1,050,000**	**$79,000 - $794,000**	**$58,000 - $580,000**
Military Installations - Proposed for Designation			
CA 17A Vandenberg AFB, North	$9,123,000	$6,900,000	$5,040,000
CA 17B Vandenberg AFB, South	$4,430,000	$3,350,000	$2,450,000
CA 19C Mugu Lagoon, North	$313,000 - $317,000	$244,000 - $248,000	$186,000 - $190,000
CA 19D Mugu Lagoon, South	$67,000 - $68,000	$52,200 - $53,100	$39,800 - $40,700
CA 24 San Onofre Beach (Camp Pendleton)	$0	$0	$0
CA 27A North Island North/ Coronado	$864,000	$654,000	$477,000
CA 27B North Island/Coronado	$505,000	$382,000	$279,000
CA 27C Silver Strand	$556,000	$420,000	$307,000
CA 27D Delta Beach	$630,000	$476,000	$348,000
CA 27F Tijuana River Beach	$10,000	$7,840	$5,730
Subtotal	**$16,499,000 - $16,504,000**	**$12,500,000**	**$9,120,000 - $9,130,000**
Military Installations - Proposed for Exclusion			
Marine Corps Base Camp Pendleton	$2,488,000	$2,010,000	$1,370,000
Naval Amphibious Base	$1,066,000	$806,000	$589,000
Subtotal	**$3,555,000**	**$2,820,000**	**$1,960,000**

Notes:
With the exception of habitat enhancement projects, these costs reflect ongoing expenses resulting from existing INRMPS.
Totals may not sum due to rounding.

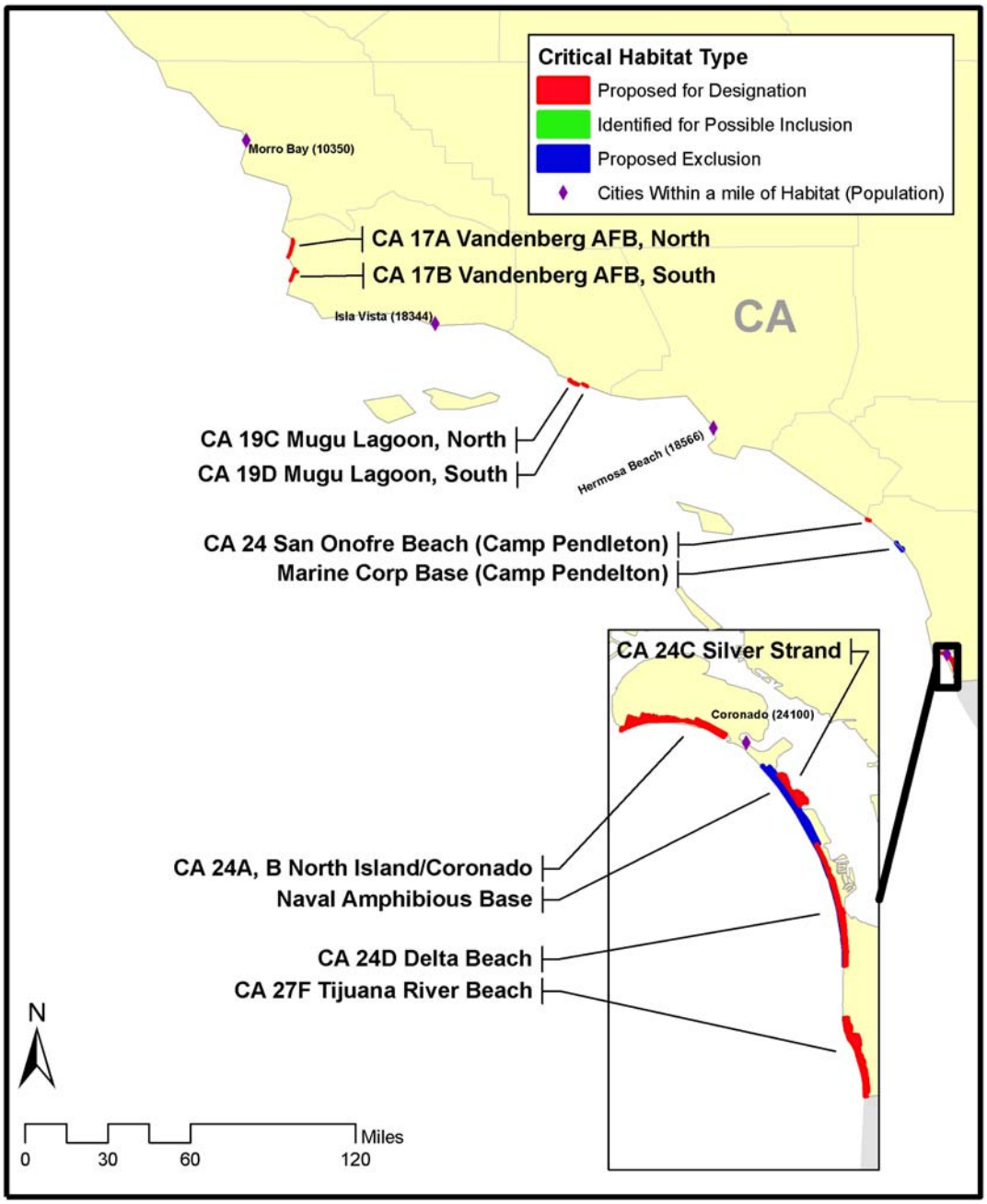
6.2 Impact to Military Facilities

292. Seven military installations in California fall within the potential critical habitat. These include: Vandenberg Air Force Base (AFB); Naval Base Ventura County, Point Mugu (NBVC), Marine Corps Base Camp Pendleton (MCBCP); and Naval Air Base Coronado (NBC), which encompasses Naval Air Station North Island (NASNI), Naval Radio Receiving Facility Imperial Beach (NRRF), and the Naval Outlying Landing Field Imperial Beach (NOLFIB). San Nicolas Island, part of the Naval Air Base Coronado, is excluded based on 4(a)3, while portions of MCBCP and Naval Amphibious Base (Coronado) are proposed for exclusion based on 4(b)2. Exhibit 6-3 shows the location of these installations.

293. Past economic impacts to these military facilities resulting from plover conservation efforts are discussed below. In addition, this analysis includes information regarding potential future economic impacts to the military installations resulting from plover conservation efforts. *As noted, this analysis does not attempt to quantify the impact to military readiness that may result from plover conservation efforts.*

Exhibit 6-3

Western Snowy Plover Proposed Critical Habitat:
Military Units



6.2.1 Vandenberg Airforce Base, North and South, Critical Habitat Units CA 17A and 17B

294. Vandenberg AFB is situated on 99,000 acres approximately 150 miles northwest of Los Angeles. The three key military activities conducted at Vandenberg with the potential to impact the plover are missile and satellite launches; Minuteman III and Peacekeeper Intercontinental Ballistic Missile (ICBM) Follow-on Operational Test and Evaluation launch program support; and the Western Range aircraft operations support activities. Aircraft operations as well as a significant portion of missile launch and support work are conducted on the northern portion of Vandenberg AFB; however, rocket launches occur on both the northern and southern portions of the base. Vandenberg also launches various space vehicles and satellites for NASA and private industry. The Western Range is a vast tracking, telemetry and command complex that collects launch-related information.[224]

295. The potential critical habitat within Vandenberg AFB covers 930 acres and lies along the coast, just south of Casmalia Hills to north of Purisima Point (CA 17A) and north of the Santa Ynez River to south of Point Arguello (CA 17B).[225] Vandenberg AFB manages all lands within these two units. In 2001, Vandenberg AFB drafted an Integrated Natural Resource Management Plan (INRMP) which addresses plover management. Although this document has been updated since 2001, the updated draft was not available for review. This analysis focuses on plover protection measures at Vandenberg based on information from the 2001 draft INRMP and information from the lead biologist at Vandenberg AFB.

296. According to the 2001 draft INRMP, the population of plovers at Vandenberg has been increasing since 1999. The key nesting and wintering areas on Vandenberg stretch from Point Sal to Purisima Point and along the beaches bordering the Santa Ynez River mouth. Protective measures are in place during nesting season in the former area, and during the winter at the latter (October to February, since 2000). The 2001 draft INRMP sets the following management goals for plover habitat:[226]

- Minimize disturbances to plovers during nesting season, 1 March through 30 September;
- Develop a long-term plover management plan to include predator management, habitat restoration, and recreational beach access management;
- Maintain and enforce warning signs for visitors concerning the protection of plover habitat;

[224] *Draft Integrated Natural Resources Management Plan, Vandenberg Air Force Base, California, Plan Period November 2001 – November 2006*, 16 November 2001, pp. 2-4.

[225] U.S. Fish and Wildlife Service, *Proposed Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004.

[226] *Draft Integrated Natural Resources Management Plan, Vandenberg Air Force Base, California, Plan Period November 2001 – November 2006*, 16 November 2001, pp. 6-25.

- Continue monitoring the plover population to determine impacts of management practices; and

- Develop a habitat management plan.[227]

297. Vandenberg AFB has consulted with the U.S. Fish and Wildlife Service (the Service) on six occasions concerning projects that have the potential to affect the plover. For the most part, these consultations relate to beach management and recreational access on Vandenberg AFB. Impacts related to recreational activity are discussed in Section 4 of the report. The conservation measures the Service recommended to Vandenberg to avoid adverse plover impacts during Atlas launches include monitoring and restrictions on aircraft surveying launches.[228]

Past Costs

298. This analysis estimates that the costs incurred by Vandenberg AFB for plover conservation efforts total $4.0 million ($5.32 million accounting for the value of time at a rate of seven percent, or $4.51 at a rate of three percent). These costs include annual plover surveys, plover monitoring during Atlas launch activities, predator management, materials, enforcement labor, and development of the Draft INRMP. The most significant costs incurred by the base are monitoring and predator management, which combined represent 75 percent of total plover related expenditures. Exhibit 6-4 presents the total economic impact of plover management on Vandenberg AFB by management activity.

[227] The Draft INRMP also notes that the habitat restoration efforts may be "funded in part by mitigation funds from the Torch Platform Irene Pipeline Oil Spill" (6-97).

[228] Costs associated with this consultation as well as the costs incurred to develop the draft INRMP are presented in Section 3.

Exhibit 6-4

PAST ECONOMIC IMPACTS OF PLOVER CONSERVATION AT VANDENBERG AIRFORCE BASE

Action	Unadjusted Past Impacts	Present Value (3%)	Present Value (7%)
Plover surveys/monitoring	$1,523,000	$1,774,000	$2,195,000
Launch monitoring	$89,000	$104,000	$128,000
Additional studies/projects*	$99,000	$127,000	$176,000
Predator Management	$1,252,000	$1,369,000	$1,540,000
Materials/equipment (signs, fences etc)	$102,000	$123,000	$157,000
Enforcement labor	$713,000	$761,000	$829,000
Environmental assessments	$50,000	$58,000	$70,000
Habitat restoration plans	$135,000	$152,000	$177,000
Draft INRMP	$40,000	$45,000	$52,000
Total	**$4,003,000**	**$4,513,000**	**$5,325,000**

Source: Personal communication with Nancy R. Read, Vandenberg Air Force Base, March 10, 2005.

Notes:
* Includes linear restriction compliance study (1995), beach grass/iceplant mapping (1995); beach debris cleanup monitoring (1999).
These impacts are generated by conservation activities at Vandenberg AFB in Units CA 17A and 17B.
Totals may not sum due to rounding.

Future Costs

299. No significant changes are anticipated to plover management efforts at Vandenberg AFB in the future. Monitoring, predator management, and enforcement activities will continue. Vandenberg AFB plans to conduct another environmental assessment and implement a multi-year habitat enhancement program in the future. Both projects are contingent on funding. Cost estimates are unavailable for these potential projects.[229]

300. The estimated future costs (2005 to 2025) to Vandenberg AFB of plover conservation efforts are $13.6 million in constant dollar terms; the present value of these impacts is $10.2 million applying a discount rate of three percent, or $7.5 million at a discount rate of seven percent. Exhibit 6-5 presents the future costs of plover management for Vandenberg AFB by activity.

301. As portions of Vandenberg AFB lie within proposed critical habitat Units CA 17A and CA17B, impacts of conservation efforts in each of these units are anticipated to be proportional to the AFB land acreage within the Units. Approximately 67 percent (696 acres) of Vandenberg land proposed for CHD is within Unit CA 17A, and 33 percent (30 acres) is within Unit CA 17B. Units CA 17A and CA 17B are therefore anticipated to bear 67 percent and 33 percent of the expected future economic impacts described in Exhibit 6-5 respectively.

[229] Personal communication with Nancy R. Read, Vandenberg Air Force Base, March 10, 2005.

Exhibit 6-5

ONGOING AND FUTURE ECONOMIC IMPACTS ON VANDENBERG AIRFORCE BASE

Action	Constant Dollars	Present Value (3%)	Present Value (7%)
Plover surveys/monitoring	$5,040,000	$3,811,000	$2,783,000
Launch monitoring	$210,000	$159,000	$116,000
Additional studies/projects	$0	$0	$0
Predator Management	$5,250,000	$3,969,000	$2,899,000
Materials/equipment (signs, fences etc)	$42,000	$32,000	$23,000
Enforcement labor	$3,011,000	$2,277,000	$1,663,000
Environmental assessments	$0	$0	$0
Total	**$13,553,000**	**$10,247,000**	**$7,483,000**

Source: Based on information provided by Nancy R. Read, Vandenberg Air Force Base, March 10, 2005 (Personal communication).

Notes:
These impacts are generated by conservation activities at Vandenberg AFB in Units CA 17A and 17B.
Totals may not sum due to rounding.

6.2.2 Naval Base Ventura County (NBVC) and Naval Air Base Coronado (NBC)

302. Environmental Management for NBVC and NBC, including NASNI, NAB, NRRF, and NOLFIB, is centrally managed by the Navy Southwest Region. The potential critical habitat units falling under the authority of the Navy Southwest Region are Mugu Lagoon, North (CA 19C) and South (CA 19D); South San Diego North Island, North and South (CA 27A and 27B); South San Diego Silver Strand (CA 27C); South San Diego Delta Beach (CA 27D); South San Diego Tijuana River Beach (CA 27F). Exhibit 6-6 presents the acreage within these units managed by the Navy.

Exhibit 6-6

ACRES OF MILITARY LANDS IN THE OXNARD LOWLANDS AND SOUTH SAN DIEGO CHD UNITS

CHD Unit	Acres
CA 19C Mugu Lagoon North	321
CA 19D Mugu Lagoon South	69
CA 27A and CA 27B North Island/Coronado	185
CA 27C Silver Strand	75
CA 27D Delta Beach	85
CA 27F Tijuana River Beach	2
Total Acres	**737**

Source: U.S. Fish and Wildlife Service, *Proposed Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004.

303. The Department of the Navy, Office of the Chief of Naval Operations, submitted comments on the proposed rule, suggesting that all critical habitat on Naval Base Coronado and Naval Base Ventura County be excluded based on 4(b)(2) and 4(a)(3).[230] The comments state that "the Navy is requesting exclusion of all Navy land from critical habitat designation for the WSP on the basis of adequate special management and protection of WSP provided by a legally operative plan which addresses the maintenance and improvement of the primary constituent elements essential to the conservation of the species."[231] In addition, the Navy identifies characteristics of specific units that indicate they should be considered for exclusion. The NRRF conducts "[m]ilitary operations ….similar to those conducted at Naval Amphibious Base (Silver Strand)" which the Service excluded based on its operational use. The Navy states that NRRF "should also be excluded due to impacts to national security."[232] Other units at NBC and NBVC or portions of them are noted in the comment on the proposed rule as being unoccupied or lacking the primary constituent elements to support plovers. Finally, the Navy notes that "all activities on both NBVC and NBC are managed with Section 7 consultation documentation….Critical habitat designations would be redundant for the protection and conservation of the WSP."[233]

304. The following sections provide a brief description of military activities conducted at these installations and a summary of plover management efforts as outlined in the facilities' INRMPs. This analysis estimates past and future impacts of plover conservation efforts. Importantly, this analysis does not attempt to quantify the impact of plover conservation efforts on military readiness.

<u>Mugu Lagoon Beach, North and South: Critical Habitat Units CA 19C and 19D (NBVC)</u>

305. NBVC, Point Mugu is situated south of Oxnard in Ventura County. Point Mugu is home to 40 military commands and its mission is to support the needs of these "tenant commands." NBVC provides full-service weapons testing and evaluation services for the Navy and the Department of Defense (DoD). In addition, air operations are conducted at Point Mugu and the base offers full-service fleet support.[234] It serves as the mobilization site for the Pacific Fleet, complete with a deep water port, rail head, and airfield. Point Mugu operates two runways, one 11,000 feet in length and the other 5,500 feet long. The former can handle the largest of Air Force aircraft, including the C-5 Galaxy.[235]

306. Critical habitat for the plover at NBVC was designated in 1999. NBVC published a final INRMP in March 2002, which addresses the plover and includes a number of protection measures. Point Mugu notes that it has monitored plovers since 1991 and nests since 1999.

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[230] Navy Comments Regarding the Proposed Critical Habitat Designation for the Pacific Coast Population of the Western Snowy Plover on Naval Base Ventura County and Naval Base Coronado.

[231] Ibid, p. 3.

[232] Ibid, p. 3.

[233] Ibid, p. 4.

[234] Department of Navy, *Final Integrated Natural Resources Management Plan, Naval Base Ventura County, Point Mugu, California*, March 2002, p. ES-2.

[235] Information is available on the Naval Base Ventura County's website at http://www.nbvc.navy.mil/.

To support the plover population, NBVC developed a Western Snowy Plover Management Emphasis Area (MEA) plan, which was incorporated into its INRMP. The goals of this program are as follows:

- "[M]onitor and manage breeding habitat of the western snowy plovers to maximize survival and productivity.
- Monitor and manage wintering and migration areas to maximize western snowy plover population survival.
- Develop mechanisms for long-term management and protection of western snowy plovers and their breeding and wintering habitat.
- Undertake scientific investigations that facilitate recovery efforts.
- Undertake public information and education programs."[236]

307. In order to achieve these goals, NBVC conducts monitoring, requires environmental training for base personnel, and supports habitat restoration activities. Since 1991, NBVC has conducted weekly window surveys for the plover. In 1999, the base began monitoring nests bi-weekly from April through July. In addition, NBVC requires all new personnel to take part in an environmental orientation, which addresses the importance of safeguarding plovers and their habitat.[237] Finally, in 2002, NBVC removed a parking lot and created plover habitat to compensate for encroachment on plover habitat from seawall repairs.[238]

Past Costs

308. The primary impacts to NBVC for plover protection have included the costs associated with monitoring and habitat restoration.[239] Exhibit 6-7 presents the economic impacts by management activity.

[236] Department of Navy, *Final Integrated Natural Resources Management Plan, Naval Base Ventura County, Point Mugu, California*, March 2002, p. 6-32.

[237] Because this orientation discusses all endangered species present on the base as well as the installation's other ongoing environmental initiatives, its costs are not included in this impact analysis.

[238] INRMP and personal communication with Martin Ring, Naval Base Ventura County, December 28, 2004.

[239] INRMP costs are included in Section 3.

Exhibit 6-7

PAST ECONOMIC IMPACTS ON NAVAL BASE VENTURA COUNTY

Action	Unadjusted Past Impacts	Present Value (3%)	Present Value (7%)	Notes
Monitoring* (1993 - 2004)	$126,000	$146,000	$178,000	Comprises weekly window surveys from 1993 to 2004, at approximately $4,500 per year and nesting season monitoring from 1999 to 2004 at approximately $12,000 per year.
Habitat Modification (2002)	$35,000 - $40,000	$38,000 - $44,000	$43,000 - $49,000	One time (2002) habitat modification costs.
INRMP Development (2002)	$100,000 - $150,000	$109,000 - $164,000	$123,000 - $184,000	One time (2002) costs of INRMP development
Total	**$261,000 - $316,000**	**$293,000 - $353,000**	**$343,000 - $411,000**	

Source: Personal communication with Martin Ring, Naval Base Ventura County, December 28, 2004.

Notes:
* Assuming a GS-12 hourly rate and a total of three hours of one biologist's time on a weekly basis year round and an additional two individuals for six hours each week during breeding season.
These impacts are generated by conservation efforts at NVBC in proposed critical habitat units CA 19C and 19D.
Totals may not sum due to rounding.

Future Costs

309. Future plover conservation efforts at NBVC primarily consist of species and habitat monitoring. However, the base is also considering building a back dune to provide better protection for the plover from the road.[240] It is assumed that the cost of this habitat modification project will be similar to the cost of habitat modifications in 2002 as described in Exhibit 6-7. The timing of this habitat modification project, however, is unclear. Exhibit 6-8 presents the anticipated future costs of plover conservation efforts at NBVC by activity.

310. As portions of NBVC lie within proposed critical habitat Units CA 19C and CA 19D, impacts of conservation efforts in each of these units are anticipated to be proportional to the NBVC land acreage within the units. Approximately 82 percent (321 acres) of NBVC land proposed for CHD is within Unit CA 19C, and 18 percent (69 acres) is within Unit CA 19D. Units CA 19C and CA 19D are therefore anticipated to bear 82 percent and 18 percent of the expected future economic impacts described in Exhibit 6-8 respectively.

[240] Base personnel will seek Service approval for this project through an informal consultation, which is anticipated to require no more than a half day to complete. Although no other projects are anticipated in the foreseeable future, base personnel noted that any additional future projects would require only an informal consultation, as they would be conducted outside of plover breeding season (personal communication with Martin Ring, Naval Base Ventura County, December 28, 2004).

Exhibit 6-8

FUTURE AND ONGOING ECONOMIC IMPACTS ON NAVAL BASE VENTURA COUNTY

Activity	Constant Dollars	Present Value (3%)	Present Value (7%)	Notes
Monitoring (2005 - 2025)	$345,000	$261,000	$191,000	Comprises weekly window surveys and nesting season monitoring from 2005 to 2025, at approximately $4,500 per year and $12,000 per year respectively.
Habitat Modification (unknown)	$35,000 - $40,000	$35,000 - $40,000	$35,000 - $40,000	As the time frame for the future habitat modification project is unknown, this analysis assumes this project occurs this year and costs are not discounted.
Total	**$380,000 - $385,000**	**$296,000 - $301,000**	**$226,000 - $31,000**	

Source: Personal communication with Martin Ring, Naval Base Ventura County, December 28, 2004.

Notes:
These impacts are generated by anticipated conservation efforts at NVBC in proposed critical habitat units CA 19C and 19D.
Totals may not sum due to rounding.

South San Diego CHD Unit (CA 27A, 27B, 27C,27D, & 27F) NBC (NAB, NASNI, NRRFIB, and NOLFIB)

311. Naval Base Coronado (NBC) is a 57,000 acre base, which includes NASNI and NAB, NRRF and NOLFIB. North Island is home to 23 squadrons and 80 additional tenant commands. The airfield at North Island has over 230 aircraft and supports three major aircraft carriers. NAB is home to thirty commands including the headquarters of the maritime special operations forces, the Navy SEALs Special Warfare Combatant Craft Crewmen, the Naval Expeditionary and Naval Special Warfare units of the Pacific Fleet, and the Navy Parachute Team. NASNI and NABC are responsible for training the crews of and maintaining the aircraft and ships of the Pacific Fleet. Additionally, the base is home to the Navy's Deep Submergence Rescue Vehicles.

312. Naval Base Coronado, NOLFIB, and NASNI (Silver Strand) have consulted with the Service regarding military operations at these facilities. Exhibit 6-9 presents the proposed military operations and the plover conservation efforts recommended by the Service at the facilities.

Exhibit 6-9

SUMMARY OF HISTORIC CONSULTATIONS FOR MILITARY ACTIVITIES AT NAVAL BASE CORONADO FACILITIES

Consultation	Operations	Conservation Measures
Naval Base Coronado, San Diego County, California 2004	Physical conditioning and operational training	– Plover nest exclosures – Predator control – Training site preparation, including relocation of nests in active training areas – Weekly reports of nest relocation – Monitoring and reporting – Placement of 2,000 cubic yards of sand to enhance habitat – Education of residents and military personnel – Signage regarding conservation measures
Naval Air Warfare Center, Weapons Division Sea Range, Outlying Landing Field, San Nicholas Island, California[241] October 15, 2001	Military training activities, barge operations, pier construction, reverse osmosis plant operation; equipment/material storage and staging areas, debris removal, roadside maintenance, recreation, natural resource research and management, routine small construction projects and utility maintenance	– Monitoring and reporting, with areas of high human or vehicle traffic surveyed once per year – Timing restrictions – Relocation of explosive ordinance disposal facility – Charges limited to two pounds maximum – Measures to minimize sound and shock – Predator control
Silver Strand and Naval Air Station North Island, San Diego County, California May 8, 2003	Amphibious and special warfare training as well as physical conditioning for personnel in the Interdeployment Training Cycle	– Predator control – Exclosures – Monitoring and reporting – Beach crossing lanes – Construction of berms – Nesting site preparation (grading and removal of non-native vegetation) – Placement of 4,560 cubic yards of sand – Relocation of plover nests from training area to nearest viable site – Signage, notification, education of troops and their families

Past Costs

313. Based on the consultation history, this analysis assumes that the primary conservation efforts undertaken by all facilities under the management of NBC are species and habitat monitoring activities, species and habitat education, and predator management. Costs estimates for these efforts were not available from NBC. However, as the NBC and NBVC facilities are managed by the Navy Southwest Region, this analysis assumes that the per-acre cost of conservation efforts is similar at these two bases. As with NBVC, this analysis does

[241] This facility is part of the NOLFIB managed by NBC.

not include the costs of species and habitat education for personnel, as this effort pertains to multiple species and environmental endeavors across the facilities and the economic impact of including the plover is anticipated to be negligible. To estimate the cost of predator management at NBC, this analysis applies available information regarding the per-acre cost of predator management at Vandenberg AFB.[242] This analysis assumes that both monitoring and predator management activities commenced in 1993 when the plover was listed. Exhibit 6-10 presents the past costs by activity.

Exhibit 6-10

PAST ECONOMIC IMPACTS ON NAVAL BASE CORONADO (NBC) FACILITIES

Activity	Unadjusted Past Impacts	Present Value (3%)	Present Value (7%)	Notes
Monitoring (1993 - 2004)	$310,000	$360,000	$439,000	Comprises per acre costs of weekly window surveys of $23 from 1993 to 2004 and nesting season monitoring per acre costs of $60 from 1999 to 2004.
Predator Management (1993 - 2004)	$1,589,000	$1,935,000	$2,534,000	Includes annual cost of predator management effort of approximately $132,000 from 1993 to 2004.
Total	**$1,899,000**	**$2,295,000**	**$2,973,000**	

Source: IEc based on per acre estimated for monitoring and predator management from NBVC and Vandenberg respectively.

Note:
These impacts are generated by conservation efforts at NBC in proposed critical habitat units CA 27A, 27B, 27C, 27D, 27F and the Naval Amphibious Base proposed for exclusion.
Totals may not sum due to rounding.

Future Impacts

314. This analysis assumes that future management is similar to past management with respect to efforts and costs. Exhibit 6-11 presents the future costs by activity.

315. Portions of NBC lie within proposed critical habitat Units CA 27A, 27B, 27C, 27D, 27F and the Naval Amphibious Base proposed for exclusion. This analysis considers the acres of NBC potential habitat in each unit relative to total acres of NBC potential habitat in order to divide the impacts by unit. Applying this assumption, approximately 24 percent (117 acres) of the impact is attributable to the potential designation of Unit 27A, 14 percent (68 acres) to CA 27B, 15 percent (75 acres) to CA 27C, 17 percent (85 acres) to CA 27D, 0.3 percent (1.4 acres) to CA 27F, and 29 percent (144 acres) to the proposed for exclusion Naval Amphibious Base.

[242] The per acre cost of predator management on Vandenberg is $270. The per acre cost of monitoring at NBVC is approximately $80 in 2004.

Exhibit 6-11

FUTURE ECONOMIC IMPACTS ON NAVAL BASE CORONADO FACILITIES

Activity	Constant Dollars	Present Value (3%)	Present Value (7%)	Notes
Monitoring (2005 - 2025)	$852,000	$644,000	$470,000	Comprises per acre annual costs of weekly window surveys of $23 and annual nesting season monitoring per acre costs of $60 from 2005 to 2025.
Predator Management (2005 - 2025)	$2,780,000	$2,102,000	$1,535,000	Includes annual cost of predator management effort of approximately $132,000 from 2005 to 2025.
Total	**$3,632,000**	**$2,746,000**	**$2,005,000**	

Source: IEc based on per acre estimated for monitoring and predator management from NBVC and Vandenberg respectively.

Notes:
These impacts are generated by anticipated conservation efforts at NBC in proposed critical habitat units CA 27A, 27B, 27C, 27D, 27F and the Naval Amphibious Base proposed for exclusion.
Totals may not sum due to rounding.

6.2.3 San Onofre Beach, Critical Habitat Unit CA 24, Marine Corps Base Camp Pendleton

316. Camp Pendleton, located north of San Diego, is situated on more than 125,000 acres and approximately 200 square miles of terrain, 17.5 miles of which are undeveloped coastal areas. Camp Pendleton provides important training facilities for active-duty and reserve Marines, Army and Navy units, as well as for national, State and local agencies. Camp Pendleton hosts more than 40,000 training sessions annually, with an estimated 60,000 military personnel taking part. These training sessions include amphibious landings, use of tracked vehicles, infantry and vehicle maneuvers, artillery and small arms firing, aerial weapons delivery, engineer support operations, logistics support, field combat service support, communications airlift support for troops and weapons, equipment maintenance, and field medical treatment.[243]

317. More than 510 acres of potential plover critical habitat lies within Camp Pendleton's borders, however, 507 acres are proposed for exclusion for reasons of national security. Further, there are no breeding plovers and hence no plover management on the three acres included in CHD.[244] Camp Pendleton, in a letter to the Service dated February 14, 2005, has requested that the remaining critical habitat be excluded under Section 4(a)(3) and Section 4(b)(2). These comments state that "we believe this exclusion (4(b)(2)) should apply to all

[243] Integrated Natural Resources Management Plan, Marine Corps Base and Marine Corps Air Station Camp Pendleton, October 2001, p. 202; and Marine Corps Base Camp Pendleton, accessed January 2005 at http://www.cpp.usmc.mil/.

[244] Personal communication with Kevin Clark, Field Officer, Carlsbad Office, Fish and Wildlife Service, on May 16, 2005.

lands within the Base boundary, particularly Green beach at the mouth of San Onofre Creek….the benefit to national security (military training at Camp Pendleton) by exclusion outweighs the benefit that the plover would receive…The Marine Corps also is certain that exclusion of all Base lands is warranted, per Section 4(a)(3), due to the extensive protection and benefit provided to the plover by management through the Base's INRMP."[245]

318. In 1995, the Service completed a biological opinion on Programmatic Activities and Conservation Plans in Riparian and Estuarine/Beach Ecosystems in Camp Pendleton. It covered training activities and requirements, infrastructure maintenance, construction projects, and recreational programs. Camp Pendleton committed to:

- Monitoring the species;
- Implementing the Ecosystem Conservation and Riparian Habitat Conservation Plans;
- Monitoring compliance with and status of conservation plans; and
- Conferring with the Service on flood control structure and construction methods.

319. In 2001, Camp Pendleton completed its INRMP, incorporating the recommendations from the 1995 Biological Opinion and adding several new efforts. The Base performs annual surveys for the plover, monitoring the breeding pairs and their reproductive success. Predator management efforts have also been undertaken. The INRMP also commits the Base to maintaining plover habitat and protecting the plover from invasive plant species.

Past Costs

320. Camp Pendleton's past conservation efforts are in areas proposed for exclusion and include surveying, nest monitoring, predator control, habitat enhancement, and restrictions on recreational beach use to minimize impacts to the plovers.[246] In addition, the Base has been engaged in a study of the impact of least tern management activities on the plover population. Exhibit 6-12 presents the past costs of plover conservation efforts incurred by Camp Pendleton.

[245] Comments of the United States Marine Corps on the Proposed Critical Habitat Designation for the Pacific Coast Population of the Western Snowy Plover, February 14, 2005, pp. 9-10.

[246] The impact of recreational beach use restrictions is discussed in Section 4 of this analysis.

Exhibit 6-12

PAST ECONOMIC IMPACTS ON MARINE CORPS BASE CAMP PENDLETON FROM WESTERN SNOWY PLOVER

Activity	Unadjusted Past Costs	Present Value (3%)	Present Value (7%)	Notes
Surveying, nest monitoring, predator control, and habitat enhancement (1993 - 2002)	$656,000	$810,000	$1,075,000	Cost impact information is not available on a disaggregated basis for these conservation efforts.
INRMP implementation (2003 - 2004)	$288,000	$302,000	$321,000	Total INRMP implementation costs were $5 million in 2003 and $3.5 million in 2004. According to Camp Pendleton, approximately 3.4 percent of total implementation costs are for plover conservation efforts.
Total	**$944,000**	**$1,111,000**	**$1,396,000**	

Source: Personal communication with William Berry, Wildlife Biologist, Marine Corps Base Camp Pendleton, March 11, 2005.

Note:
A small portion (three acres) of Camp Pendleton lands are proposed for designation in Unit CA 24. The remaining 507 acres of critical habitat in the Camp is proposed for exclusion.

Future Costs

321. Given the management efforts already in place, the Base does not foresee any changes to its plover conservation program after the designation of critical habitat.[247] The Base is, however, considering reviewing its Riparian Conservation plan, which would require a consultation with the Service. The designation of critical habitat for the plover may result in Camp Pendleton conducting a higher level of consultation with the Service for any actions that might affect the plover, which would increase staff time. The amount by which staff time may be increased due to the inclusion of the plover in the consultation, however, is speculative and thus not included in this analysis.

322. The potential future impacts associated with plover conservation efforts are therefore due to the implementation of the INRMP at Camp Pendleton as described in Exhibit 6-13. Impacts of conservation efforts at Camp Pendleton are attributed to the various installations based on acreage, most of which is proposed for exclusion from critical habitat designation for the plover. A small portion (three acres) of Camp Pendleton lands are proposed for designation in Unit CA 24.

[247] Personal communication with William Berry, Wildlife Biologist, Marine Corps Base Camp Pendleton, January 6, 2005.

Exhibit 6-13

FUTURE ECONOMIC IMPACTS ON MARINE CORPS BASE CAMP

Activity	Constant Dollars	Present Value (3%)	Present Value (7%)	Notes
INRMP implementation (2005 - 2025)	$2,488,000	$2,013,000	$1,374,000	Annual impacts of future INRMP implementation are anticipated to be the same as the 2004 impacts in constant dollar terms, approximately $118,000 per year (3.4 percent of the total annual INRMP implementation costs of $3.5 million).

Source: Personal communication with William Berry, Wildlife Biologist, Marine Corps Base Camp Pendleton, March 11, 2005.

Notes:
A small portion (three acres) of Camp Pendleton lands are proposed for designation in Unit CA 24. The remaining 507 acres of critical habitat in the Camp is proposed for exclusion.

6.3 Impacts To Gravel Mining

323. This section describes the past and expected future economic impacts to gravel mining activities associated with plover conservation efforts in proposed critical habitat, areas identified for possible inclusion, and areas proposed for exclusion (collectively, areas of potential critical habitat). This section is divided into four parts. The first provides an overview of gravel mining in the region; the second reviews the permitting process and outlines the recommended conservation efforts; the third section describes the impacts to independent gravel miners of plover conservation efforts; and the final section provides a summary of the past and expected future impacts to gravel mining.

6.3.1 Background

324. Gravel mining occurs in one proposed critical habitat unit, CA 4D Eel River Gravel Bar. Unit CA 4D includes lands owned by Humboldt County, California State Lands Commission, and private owners. Exhibit 6-14 presents the number of acres of land managed by each owner.

325. Humboldt County has 93 extraction sites, with sand and gravel among the most important materials extracted.[248] Of the gravel extracted in 1998, roughly 50 percent was taken from gravel bars along the Eel River. Six gravel extractors operate on the Eel River: Eureka Sand and Gravel, Drake Materials, Mercer-Fraser, Hansen Truckstop Inc., Rock and Gadberry Gravel, and the Humboldt County Department of Public Works.

[248] Humboldt County Community Development Services, *Humboldt 21st Century Natural Resources and Hazards Report: Mineral & Energy Report*, 2002, p. 1. Accessed Online on March 4, 2005 at http://www.planupdate.org/.

Exhibit 6-14

ACRES OF HUMBOLDT COUNTY, CALIFORNIA STATE LANDS COMMISSION AND PRIVATE GRAVEL MINING LANDS IN THE EEL RIVER GRAVEL BARS CHD UNIT CA 4D

Owner	**Acres**
Humboldt County	176
California State Lands Commission	79
Private	938
Total	**1,193**

Source: U.S. Fish and Wildlife Service, *Proposed Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover*, 69 FR 75608, December 17, 2004.

Note:
Total may not sum due to rounding.

6.3.2 Permitting and Conservation Recommendations

326. In 1996, the U.S. Army Corps of Engineers (USACE) began issuing three-year permits for gravel extraction to operators on the Eel River. At this time, USACE established a process through which operators would meet the regulatory and permitting requirements of multiple agencies by submitting monitoring data to USACE. This agreement, a Letter of Permission (LOP), gave USACE authority to oversee gravel extraction collaboratively with Environmental Protection Agency (EPA), National Marine Fisheries Service (NMFS), the Service, California Coastal Commission (CCC), California Department of Fish and Game (CDFG), and California Regional Water Quality Control Board (RWQCB). These agencies revisit the LOP every five years and meet annually to consider new applications and review monitoring results from the previous year.

327. The first LOP was issued in 1996 and renewed through informal consultation with the Service (and the other agencies) annually for three years. A new LOP was issued in 2004, for a five-year period; however, the Service's Biological Opinion was not completed in time for the 2004 extraction season. A one-year extension to address the 2004 season was issued. The Biological Opinion is scheduled to be incorporated into the LOP in May 2005.[249]

328. The annual application and evaluation process begins with the collection of information by each gravel operator for submission to the County of Humboldt Extraction Review Team (CHERT). Each operator is required to submit extraction amounts, cross-section surveys, biological monitoring and aerial photos to CHERT. CHERT compiles the monitoring information from each gravel operator into an annual report for USACE detailing the impact of each season's extraction activities on plover habitat. In its annual report, CHERT "evaluates the past extractions, provides recommendations on future extractions, identifies changes in the mapped riparian areas, lists the cumulative amount of impacted

[249] U.S. Army Corps of Engineers, *Letter of Permission Procedure (LOP 2004-1) for Gravel Mining and Excavation Activities Within Humboldt County*, 2004.

riparian vegetation from extraction activities, includes the biological monitoring, and provides the status of mitigation areas approved by USACE and the other regulatory agencies."[250]

329. In March, USACE holds a meeting with EPA, NMFS, the Service, CCC, CDFG, and RWQCB to review the applications and the annual monitoring data. "If a proposed (new) activity will meet the conditions of the LOP procedures, it will be authorized by LOP. If an authorized activity has met the conditions of the LOP, and there is assurance that its planned operation for the next season will meet the LOP conditions, based on the information submitted, it will be allowed to continue for the next season under the existing authorization."[251]

330. In addition to the monitoring requirements, the LOP, reflecting previous Biological Opinions drafted by the Service, stipulates specific precautions that operators must take in order to minimize the impact to plovers and habitat. The Service has determined vehicle traffic, noise, and regrading of the landscape are the primary threats to plovers from gravel mining and recommends the following guidelines:[252, 253]

- Pre-extraction activities occurring between March 1 and August 22 within plover habitat should include a Service-approved plover surveyor, who will determine the status of plovers in the area;
- Operators should begin extractions after September 15, if possible, but not before July 22;
- Extraction can occur between July 22 and September 15 after three consecutive days of surveys indicate that no plovers or nests exist within 1,000 feet of the extraction area;
- Surveys will continue at extraction sites in operation between July 22 and September 15 to monitor for the movement of plovers into the work area;
- If a plover nest is within 1,000 feet of the extraction area, activities will not begin until the nest has hatched; and
- Vehicle use should occur only when necessary between March 1 and August 22, but not at night.

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[250] Klein et al., CHERT, *1998 Post-Extraction Report*, 1999. Accessed on line at http://www.calawnet.com/environmental/98report.html on March 2, 2005.

[251] U.S. Army Corps of Engineers, *Letter of Permission Procedure (LOP 2004-1) for Gravel Mining and Excavation Activities Within Humboldt County*, 19 August 1996.

[252] Long, Michael, *Batched Section 7 Consultation Regarding Gravel Extraction Under an Individual Permit for the Hauk Bar, and LOP 2004-1, Eel River Gravel Bars, Humboldt County, California* (Corps Files 27725N, 284270N), U.S. Fish and Wildlife Service, Department of Interior, 10 September 2004.

[253] In the past, the LOP was the only mechanism through which to get approval for extraction. Currently, operators can apply for individual permits.

6.3.3 Plover Conservation Efforts

331. The LOP procedures and timing restrictions have two impacts on gravel miners. First, operators incur the costs of the annual survey and monitoring activities, which include cross-section surveys, biological monitoring, and aerial photos. Second, the timing restrictions in the LOP may potentially delay the start of mining operations to September 15, may modify extraction procedures, and may cause unpredictable increases in annual operating costs.[254] According to one operator, these time constraints may cause operational costs to increase by 25 to 35 percent as the companies must conduct more intensive extraction activities over a shorter period of time to recover their standard annual haul.[255] Another operator noted the need to pay overtime and use larger or additional trucks in order to compensate for the short extraction season.[256] Flexibility in operating schedule, however, enables an operator to manage increases in extraction costs in a given year. Operators working on other Humboldt County gravel bars can mine unrestricted areas first and shift to the restricted bars later in the season.

332. Gravel extractors have not indicated that they had experienced delays specifically due to implementing plover conservation efforts. According to the operators on the Eel River, the delays experienced have stemmed from "bottlenecks" in the regulatory process, specifically delays related to approval of the LOP and LOP extensions.[257]

333. This analysis accordingly does not quantify the cost of delays related to the permitting process. Operators noted, however, that these delays had caused them to incur additional costs, including expenses associated with overtime pay and equipment rental.[258]

6.3.4 Summary of Impacts to Gravel Mining

334. This section summarizes past and future costs to gravel mining activities. As previously indicated, the key costs relate to the annual monitoring requirements of the LOP. Although delays in the start of the extraction season are a possible source of additional costs,

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[254] In recent years, the renewal of the LOP has delayed the issue of permits to mine on the Eel River. In addition, although the start of the annual gravel season on the Eel River is affected by the plover, the close of the season is dictated by the salmon spawning season. Operators must be off the bar by October 15. Such time constraints may only be partially related to the plover.

[255] Personal communication with David Ripple, Drake Materials, March 1, 2005.

[256] Personal communication with Keith Hess, Consultant for Hansen and Rock and Gadberry Gravel, January 27, 2005.

[257] The County of Humboldt Department of Public Works chose not to extract gravel in 2003 because the permitting process had been delayed into September. At this point in the season, the DPW had to focus manpower and resources on rehabilitating the roads in preparation for winter. The County had a stockpile of gravel that would enable them to meet their gravel needs for a year without extracting or purchasing additional gravel. Sims, Hank, "Gravel regs in the pipeline Miners upset, enviros say restrictions watered down for political reasons," *North Coast Journal*, 11 September 2003. Accessed Online 17 December 2004 at www.northcoastjournal.com/091103/news0911.html.

[258] The Humboldt County Department of Public Works (DPW) estimated that buying gravel on the open market would increase gravel costs by $300,000 per year. In contrast, private gravel extractors would likely be able to extract gravel at other locations or otherwise adjust to the delays introduced by the permitting process (personal communication with Cheryl Dillingham, Humboldt County Department of Public Works, March 18, 2005).

such delays have, to date, been associated with the permitting process, not the plover. As a result, this analysis does not quantify these costs or estimate any future costs associated with delays.

335. This analysis estimates that the annual monitoring costs incurred by gravel operators range from $5,000 to $50,000. In accordance with the LOP, gravel miners are required to submit extraction amounts, cross-section surveys, biological monitoring and aerial photos to CHERT. These annual impacts began in 1996 and are expected to remain constant through 2025. Exhibits 6-15 and 6-16 summarize the past and future impacts to gravel mining activities of plover conservation efforts.

Exhibit 6-15

PAST ECONOMIC IMPACTS ON GRAVEL MINING ACTIVITIES

Activity	Constant Dollars	Present Value (3%)	Present Value (7%)	Notes
Species and habitat monitoring (1996 - 2004)	$45,000 - $450,000	$52,000 - $523,000	$64,000 - $641,000	Includes annual monitoring costs of $5,000 to $50,000.

Source: Personal communication with gravel mining operations along the Eel River.

Notes:
Gravel mining occurs in one proposed critical habitat unit, CA 4D Eel River Gravel Bar.

Exhibit 6-16

FUTURE ECONOMIC IMPACTS ON GRAVEL MINING ACTIVITIES

Activity	Constant Dollars	Present Value (3%)	Present Value (7%)	Notes
Species and habitat monitoring (2004 - 2025)	$105,000 - $1,050,000	$79,000 - $794,000	$58,000 - $580,000	Includes annual monitoring costs of $5,000 to $50,000.

Source: Personal communication with gravel mining operations along the Eel River.

Notes:
Gravel mining occurs in one proposed critical habitat unit, CA 4D Eel River Gravel Bar.

APPENDIX A:

SMALL ENTITY IMPACTS AND ENERGY IMPACTS

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APPENDIX A: SMALL ENTITY AND ENERGY IMPACTS ANALYSES

336. This appendix considers the extent to which the analytic results presented in the previous sections reflect potential future impacts to small entities and the energy industry. The screening analysis presented in this appendix is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) in 1996. Information for this analysis was gathered from the Small Business Administration (SBA), U.S. Census Bureau, and the Risk Management Association (RMA). The energy analysis in Section A.2 is conducted pursuant to Executive Order No. 13211.

A.1 SBREFA Analysis

337. In accordance with SBREFA, when a Federal agency publishes a notice of rulemaking for any proposed or final rule, it must make available for public comments a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).[259] No regulatory flexibility analysis is required, however, if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities.[260] 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.

338. To assist in this process, the following represents a screening level analysis of the potential for plover conservation efforts to affect small entities. This analysis is based on the estimated impacts associated with the proposed rulemaking as described in Sections 3, 4, 5 and 6 of this analysis.

339. This appendix first describes the governments and industries that may experience impacts due to plover conservation efforts within the potential critical habitat. It then provides more detail on the specific type of impacts potentially affecting small entities. Following is a summary of the results of the analysis of impacts to small entities. Details are provided in the following discussion.

[259] 5 U.S.C. 601 et seq.

[260] Thus, for a regulatory flexibility analysis to be required, impacts must exceed a threshold for "significant impact" and a threshold for a "substantial number of small entities." 5 U.S.C. 605(b).

- **Impacts as a result of reduced recreational opportunities**. Section 4 of this analysis discusses impacts of restrictions on recreational activity at beaches containing potential critical habitat for the plover. Individual recreators experience welfare losses as a result of foregone or diminished trips to the beach. If fewer trips are taken by recreators, then local businesses serving these visitors may be indirectly affected.

- **Impacts to development activities.** The economic impact to the Monterey Bay Shores development project of future plover conservation efforts is approximately 2.5 percent of the projected tax revenue expected from the completed development project.

- **Impacts to the gravel mining industry.** Five gravel mining companies conduct business within the potential critical habitat for the plover. The annualized impact of hiring plover monitors at gravel mining sites is expected to be approximately 0.5 percent of the total sales of the five mining companies operating in potential critical habitat in Humboldt County.

A.1.1 Identification of Activities That May Involve Small Entities

340. This analysis estimates prospective economic impacts due to implementation of plover conservation efforts in five categories:

1. Habitat and plover management activities;
2. Beach-related recreation activities;
3. Residential and related development;
4. Activities on military lands; and
5. Commercial gravel mining.

341. Of these five categories, impacts of plover conservation to two are not anticipated to affect small entities for the following reasons:

- *Habitat and plover management activities:* As detailed in Section 3 of this analysis, the implementation of plover and habitat management activities impact beach managers. Costs to beach managers comprise ongoing beach and habitat management efforts that may benefit the plover, and costs associated with the development of Habitat Conservation Plans (HCPs). The costs of these efforts are anticipated to be borne by Federal (U.S. Fish and Wildlife Service, Bureau of Land Management, Forest Service), State (California State Parks, California Department of Fish and Game, University of California, Oregon Parks and Recreation Department, Washington Department of Parks and Recreation), County (San Luis Obispo Coast District, Humboldt County, Coos County), and City (San Diego) agencies. None of these governments and agencies are small governments as defined by SBA, therefore, the economic impacts resulting from the implementation

of habitat and plover management on beaches in the potential critical habitat area are not relevant to the screening analysis.

- *Activities on military lands:* Section 6 of this analysis describes impacts of plover conservation efforts on military lands within the potential critical habitat areas for the plover. Because economic impacts of implementing these conservation efforts are borne by the military, this category of impacts is not relevant to the small business analysis.

Accordingly, the small business analysis contained in this appendix focuses on economic impacts to the recreation, development, and the gravel mining industries.

A.1.2 Analysis of Impacts to Small Businesses Related to Recreation

342. As discussed in Section 4 of this analysis, the directly regulated entities in the analysis of recreation impacts are the beach managers. The managers, for example, may construct fencing or exclosures for the purpose of plover and habitat protection. As described above in section A.1.1, beaches where impacts are anticipated are managed by large government agencies. As a result, the directly affected entities are not subject to this screening analysis.

343. The economic impact of these beach management activities, however, are also borne by recreators whose activities are interrupted by restrictions on recreational opportunities. Two distinct economic models are employed in Section 4 of this analysis to capture the potential impacts of restrictions on pedestrian, equestrian, off-road vehicle (ORV), and associated uses of the beaches within the potential critical habitat. Impacts to recreators comprise between 90 and 95 percent of the total present value costs of plover conservation efforts estimated in this analysis.

344. "Method 1" of the recreation analysis assumes that as a result of fencing and closures, fewer people make trips to the beach and estimates the value of these lost trips. Method 1 concludes that beach trips may decrease by 1.5 million per year. Depending on the type of activity lost to the recreator (e.g., opportunity for walking on the beach, driving, fishing, surfing, etc.), the per trip loss ranges from $30 to $118 (2004 dollars). Importantly, these impacts represent the value to recreators of lost beach trips and are social welfare impacts, not cash flow changes. These impacts are not borne by businesses, but are experienced by individuals.

345. "Method 2" assumes that plover management activities do not decrease pedestrian or equestrian visitation to potential critical habitat. Rather, it assumes that visitation rates remain stable but that the quality of the trip per visitor is diminished due to the lesser size of the beaches or due to decreased mechanical beach raking. These impacts are borne by all individuals who visits these beaches during plover breeding season, approximately 7 million visitors per year. For each diminished trip, an individual experiences a loss in welfare of approximately $1.40 for each mile of beach that is fenced or $6 per trip where frequency of beach raking is decreased (2004 dollars). Again, these impacts a social welfare impacts that are experienced by individuals.

346. If fewer trips are made to beaches, local establishments providing services to recreators may be indirectly affected by plover conservation efforts. Decreased visitation may reduce the amount of money spent in the region across a variety of industries including food and beverage stores, food service and drinking places, accommodations, transportation, and rental services. A number of public comments received on the proposed rule asserted that local communities would be severely impacted by restrictions on recreational activities. For example, representatives of Friends of Oceano Dunes expressed concern that as a result of restrictions at Oceano Dunes State Vehicular Recreation Area, businesses in small town of Oceano may be adversely impacted.[261] The Coos Bay County Commissioners expressed concern about the potential economic impact of habitat conservation efforts to their Oregon community.[262]

347. Section 4 of this analysis applies a commonly applied regional impact model, IMPLAN, to determine potential regional economic impacts of decreases in beach visitation. The analysis concludes that, incorporating multiplier effects in the regional economy, the estimated impact of a loss of 1.5 million trips in 2005 is $127.1 million (see Exhibit 4-31) in units proposed for designation in California, Oregon, and Washington. Section 4.6 provides information on the calculation and caveats of this result.

348. The scope of the designation and uncertainty regarding the specific clientele of these businesses makes identification of the exact businesses that may be affected difficult. To the extent that these expenditures are concentrated in specific geographic locations, changes in beach recreation activity levels could have an impact on affected small businesses. Thus, reduced visitation that results in revenue, employment and tax losses may pose considerable burdens to local communities.

349. This analysis therefore provides a regional profile of the types of potentially affected industries. The first column of Exhibit A-1 provides information on the types of businesses that may be experience these regional impacts. The second column highlights the small business size standards as defined by the SBA for these recreation-related industries.

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[261] Personal communication with Friends of Oceano Dunes president Jim Suty, December 20, 2004.

[262] Letter from Board of Commissioners, Coos County, submitted as public comment on the proposed rule, dated February 17, 2005.

Exhibit A-1 **SMALL BUSINESS SIZE STANDARDS FOR ACTIVITIES WITH POTENTIAL SMALL BUSINESS IMPACTS**	
NAICS Code/Industry	**Size Standard**
Recreation	
Food and Beverage Stores	
445110: Supermarkets and Other Grocery (Except Convenience) Stores	$23,000,000
445120: Convenience Stores	$23,000,000
445299: Other Specialty Food Stores	$6,000,000
445310: Beer, Wine and Liquor Stores	$6,000,000
Food Service and Drinking Places	
722110: Full-Service Restaurants	$6,000,000
722211: Limited Service Eating Places	$6,000,000
722410: Drinking Places	$6,000,000
Accommodations	
721110: Hotels (except Casino hotels) and Motels	$6,000,000
721211: Recreational Vehicle Parks and Recreational Camps	$6,000,000
721214: Recreational and Vacation Camps (except Campgrounds)	$6,000,000
Transportation	
441210: Recreational Vehicle Dealers	$6,000,000
441221: Motorcycle Dealers	$6,000,000
441310: Automotive Parts and Accessories Stores	$6,000,000
441320: Tire Dealers	$6,000,000
447190: Service Stations, Gasoline	$7,500,000
532120: Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing	$21,500,000
Source: SBA's Table of Small Business Size Standards based on NAICS 2002, accessed at http://www.sba.gov/size/indextableofsize.html.	

349. Exhibit A-2 illustrates the total number of businesses in counties containing potential critical habitat that may be experience losses in sales due to decreased visitation as a result of recreational use restrictions on area beaches. This exhibit also indicates the number of these businesses that are classified as small businesses (based on SBA size standards described in Exhibit A-1).

350. Specifically, there are 63,646 small businesses in these industries in the counties containing potential critical habitat for the plover. Depending on the sector, between 42 percent and 100 percent of the businesses serving recreators in this region are small businesses. Sales generated by these small businesses are estimated at $121 billion.

EXHIBIT A-2

SMALL BUSINESS IMPACTS ASSOCIATED WITH RECREATION-RELATED EXPENDITURES

Economic Sector	# Businesses in Counties Containing Potential Critical Habitat[a]	# of Small Businesses in Counties Containing Potential Critical Habitat[a]	Average Net Sales per Small Business[b]	Total Net Sales for Small Business in Counties Containing Potential Critical Habitat[c]
Food and Beverage Stores				
445110: Supermarkets and Other Grocery (Except Convenience) Stores	9,794	9,418	$7,588,467	$90,677,036,434
445120: Convenience Stores	2,315	2,286	$4,285,154	
445299: Other Specialty Food Stores	2,928	2,610	$1,456,219	
445310: Beer, Wine and Liquor Stores	3,608	3,556	$1,578,251	
Subtotal Food and Beverage Stores	*18,645*	*17,870*	---	
Accommodation, Food Service and Drinking Places				
722110: Full-Service Restaurants	33,484	15,565	$1,652	$23,956,955,919
722211: Limited Service Eating Places	16,817	10,732	$1,607,812	
722410: Drinking Places	2,877	2,804	$1,197	
721110: Hotels (except Casino hotels) and Motels	5,522	3,770	$1,405,343	
721211: Recreational Vehicle Parks and Recreational Camps	153	149	$1,072,877	
721214: Recreational and Vacation Camps (except Campgrounds)	778	749	$1,621,960	
Subtotal Accommodation, Food Service and Drinking Places	*59,631*	*33,769*	---	
Transportation				
441210: Recreational Vehicle Dealers	275	249	$2,712,808	$20,991,033,993
441221: Motorcycle Dealers	890	850	$2,794,254	
441310: Automotive Parts and Accessories Stores	4,395	4,249	$2,066,582	
441320: Tire Dealers	1,450	1,384	$2,150,061	
447190: Service Stations, Gasoline	4,624	4,449	$1,389,939	
Subtotal Transportation	*11,634*	*11,181*	---	
Rental Services				
532120: Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing	*855*	*826*	$4,857,782	$4,012,528,249
Total, All Recreation-Related Sectors	**90,765**	**63,646**	**---**	**$120,978,743,298**

Notes:

[a] Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifiers."

[b] Risk Management Association, "Annual Statement Studies: Financial Ratio Benchmarks 2004-2004," 2004. Average annual net sales per small business was estimated by dividing net sales estimates per NAICS code by the number of businesses surveyed. For NAICS codes 445299, 445310, 722110, 722211, 722410, 721110, 721211, 721214, 441210, 441221, 441310, 441320, and 447190 the average net sales per small business averages sales for small businesses with revenues between $0 and $5 million. Because the number of small businesses includes all businesses with sales of less than $6 million ($7.5 million for 447190), the average sales for the small businesses in these categories as estimated likely *understates* the actual average sales. For NAICS codes 445110 and 445120 the small business threshold is sales of less than $23 million, and for 532120 the threshold is $21.5 million. As the average net sales per small business for these categories is estimated for businesses with sales between $0 and $25 million, this analysis may *overstate* the actual average sales in these industries.

[c] Total net sales for small businesses in counties containing potential critical habitat is estimated by multiplying the number of small businesses in the region by the average annual net sales per business.

A.1.3 Analysis of Impacts to Small Businesses Related to Development

351. As detailed in Section 5 of this analysis, direct impacts to development activities may be manifested in modification to development projects, such as limiting construction of beach access infrastructure (e.g., docks and stairs) or stabilization activities (e.g., use of riprap). In some cases, the extent of developable land may be reduced due to the presence of the plover or potential habitat. Indirect impacts to landowners are therefore potential reductions in property values associated with decreased access to the beach.

352. In the case that plover conservation efforts result in decreased property values, impacts would be expected to be borne primarily by landowners of coastal properties, such as residences. This analysis, however, does not forecast decreases in property value.

353. Two development projects occurring within the potential critical habitat are expected to incur costs associated with plover conservation efforts as described in Section 4. These projects are: 1) the expansion of Humboldt County campgrounds; and 2) the Monterey Bay Shores Development Project in Sand City. The former of these projects is funded by Humboldt County. As this County is not a small government, impacts to this project are not relevant to the small business analysis.[263]

Monterey Bay Shores Development Project

354. The Monterey Bay Shores Development Project is a large-scale development designed to promote tourism in the region. The planned project is within Sand City. Sand City and the Sand City Redevelopment Agency are in the process of drafting an HCP associated with this development project in consideration of the plover along with other sensitive species. With a population of 270 people, Sand City is considered a small government.[264] These entities have thus far spent up to $400,000 in administrative costs creating the HCP and up to $4 million in purchase of mitigation land to be dedicated to open space (in constant dollar terms) and habitat as described in Section 5.3.3 of this analysis.

355. Future economic impacts associated with the Monterey Bay Shores Development Project pursuant to the Draft HCP are due to the proposed employment of two full time stewards to monitor human interaction with the plover and habitat on nearby beaches at a cost of $50,000 to $100,000 per year in constant dollar terms. The present value of these costs over 20 years is approximately $578,000 to $1.16 million applying a seven percent discount rate, or $793,000 to $1.59 million applying a three percent discount rate. This

[263] The RFA/SBREFA defines "small governmental jurisdiction" as the government of a city, county, town, school district or special district with a population of less than 50,000 (5 U.S.C. 601 et seq.). The population of Humboldt County in 2000 was approximately 127,000 (U.S. Census Bureau, Census 2000 and State County QuickFacts, accessed at http://quickfacts.census.gov/qfd).

[264] Sand City, "Facts and Statistics about Sand City," accessed at https://www.sandcity.org/statistics/ index.html on April 7, 2005.

translates to an annualized cost of $54,000 to $107,000 at a seven percent discount rate ($52,000 to $103,000 at a three percent discount rate).

356. Sand City estimates that, in the case that the development site is built out the authorized level, project would bring in to the City approximately $3.7 million to $4.3 million per year in tax revenue.[265] The economic impact of the quantified future plover conservation efforts associated with this project is therefore approximately 2.5 percent of the tax revenue expected from the completed project.

A.1.4 Analysis of Impacts to Small Businesses Related to Gravel Mining

357. Five gravel mining companies exist within Unit CA-4D of the potential critical habitat for the plover in Humboldt County, California. Personal communication with three of these companies, Eureka Sand and Gravel, Mercer-Fraser, and Hansen Truck Stop, Inc. confirmed that all three are small businesses.[266] For the purposes of this analysis, the remaining two gravel companies, Drake Sand and Gravel, and Rock and Gadberry Gravel, are assumed to be small businesses as well.

358. As described in Section 6 of this analysis, impacts of plover monitoring to these gravel operations is expected to cost $5,000 to $50,000 per year in constant dollar terms. The present value of these costs from 2005 to 2025 is approximately $58,000 to $598,000 applying a seven percent discount rate, or $79,000 to $794,000 applying a three percent discount rate. This translates to an annualized cost of $5,000 to $54,000 at a seven percent discount rate ($5,000 to $52,000 at a three percent discount rate).

359. The combined sales of the five small gravel-mining companies in this region in 2004 was approximately $11.8 million.[267] The annualized impact of hiring plover monitors is therefore approximately 0.5 percent of the total sales of these five mining companies.

A.2 <u>Potential Impacts to the Energy Industry</u>

360. 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

[265] Law Offices of Thomas D. Roth, January 19, 2005, "Section 4(b)(2) Petition of Sand City, California to Exclude Certain Lands from Critical Habitat for the Western Snowy Plover," pg. 10.

[266] The SBREFA small business size standard for NAICS code 212321, Construction Sand and Gravel Mining is 500 employees (SBA's Table of Small Business Size Standards based on NAICS 2002, accessed at http://www.sba.gov/size/indextableofsize.html). Personal communication with Jay Fullerton, Eureka Sand and Gravel on April 6, 2005; personal communication with Kathy O'Neill, Mercer-Fraser, April 6, 2005; and personal communication with Debbie Guen, Hansen Truck Stop, Inc., April 6, 2005.

[267] Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifiers."

the supply, distribution, and use of energy."[268] The Office of Management and Budget has provided guidance for implementing this Executive Order that outlines nine outcomes that may constitute "a significant adverse effect" when compared without 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 kilowatts-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.[269]

361. As none of these criteria is relevant to this analysis, energy-related impacts associated with plover conservation efforts within the potential critical habitat are not expected.

[268] 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.

[269] Ibid.

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APPENDIX B:

IMPACTS TO ALL ACTIVITIES BY UNIT

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APPENDIX B: IMPACTS TO ALL ACTIVITIES BY UNIT

POTENTIAL CRITICAL HABITAT UNITS	Past Impacts (1993-2004) Unadjusted Impacts		Past Impacts (1993-2004) Present Value 3%		Past Impacts (1993-2004) Present Value 7%		Future Impacts (2005-2025) Constant Dollars		Future Impacts (2005-2025) Present Value 3%		Future Impacts (2005-2025) Present Value 7%		Annualized (3%)		Annualized (7%)	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Units proposed																
WA 2. Damon Pt, Oyhut	$14,000	$54,000	$15,000	$57,000	$16,000	$62,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WA 3. Midway Beach	$10,000	$39,000	$11,000	$42,000	$12,000	$45,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WA 4. Leadbetter Pt	$25,000	$97,000	$26,000	$103,000	$28,000	$111,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 3. Bayocean Spit	$0	$1,000	$0	$1,000	$0	$1,000	$431,000	$2,572,000	$296,000	$1,764,000	$187,000	$1,111,000	$19,000	$114,000	$17,000	$102,000
OR 7. Sutton/Baker Beaches	$230,000	$231,000	$272,000	$272,000	$340,000	$341,000	$413,000	$413,000	$312,000	$312,000	$228,000	$228,000	$20,000	$20,000	$21,000	$21,000
OR 8A. Siltcoos River Spit	$230,000	$231,000	$272,000	$272,000	$340,000	$341,000	$413,000	$413,000	$312,000	$312,000	$228,000	$228,000	$20,000	$20,000	$21,000	$21,000
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	$130,000	$131,000	$154,000	$154,000	$192,000	$193,000	$203,000	$203,000	$154,000	$154,000	$112,000	$112,000	$10,000	$10,000	$10,000	$10,000
OR 8D. Tenmile Creek Spit	$284,000	$363,000	$335,000	$429,000	$419,000	$537,000	$532,000	$707,000	$402,000	$534,000	$293,000	$389,000	$26,000	$35,000	$27,000	$36,000
OR 9. Coos Bay N Spit	$430,000	$474,000	$545,000	$592,000	$754,000	$805,000	$527,000	$527,000	$398,000	$398,000	$291,000	$291,000	$26,000	$26,000	$27,000	$27,000
OR 10A. Bandon to Floras Lake	$345,000	$770,000	$369,000	$852,000	$403,000	$978,000	$756,000	$1,889,000	$571,000	$1,425,000	$417,000	$1,037,000	$37,000	$92,000	$38,000	$96,000
CA 1. Lake Earl	$28,000	$45,000	$30,000	$48,000	$32,000	$52,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 2. Big Lagoon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 3A. Clam Beach/Little Riv	$40,000	$44,000	$43,000	$47,000	$47,000	$52,000	$879,000	$1,527,000	$663,000	$1,143,000	$483,000	$824,000	$43,000	$74,000	$45,000	$76,000
CA 3B. Mad River	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$36,000	$36,000	$27,000	$27,000	$19,000	$19,000	$2,000	$2,000	$2,000	$2,000
CA 4A. Humboldt Bay, S Spit	$110,000	$130,000	$116,000	$137,000	$124,000	$146,000	$895,000	$900,000	$676,000	$681,000	$494,000	$497,000	$44,000	$44,000	$46,000	$46,000
CA 4B. Eel Riv N Spit & Beach	$23,000	$23,000	$24,000	$24,000	$26,000	$26,000	$158,000	$158,000	$119,000	$119,000	$87,000	$87,000	$8,000	$8,000	$8,000	$8,000
CA 4C. Eel Riv S Spit & Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4D. Eel River Gravel Bars	$86,000	$587,000	$95,000	$669,000	$111,000	$799,000	$158,000	$1,334,000	$119,000	$1,009,000	$87,000	$736,000	$8,000	$65,000	$8,000	$68,000
CA 5. MacKerricher Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 6. Manchester Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 7. Dillon Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 8. Pt Reyes Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 9. Limantour Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 10. Half Moon Bay	$11,000	$11,000	$12,000	$12,000	$13,000	$13,000	$63,000	$63,000	$48,000	$48,000	$35,000	$35,000	$3,000	$3,000	$3,000	$3,000
CA 11B. Scott Cr. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 11C. Wilder Cr. Beach	$11,000	$11,000	$12,000	$12,000	$13,000	$13,000	$63,000	$63,000	$48,000	$48,000	$35,000	$35,000	$3,000	$3,000	$3,000	$3,000
CA 12A. Jetty Rd to Aptos	$4,928,000	$11,757,000	$5,238,000	$12,493,000	$5,671,000	$13,520,000	$38,394,000	$92,231,000	$28,434,000	$68,277,000	$20,235,000	$48,563,000	$1,845,000	$4,429,000	$1,867,000	$4,482,000
CA 12B. Elkhorn Sl Mudflat	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 12C. Monterey to Moss Lnd	$4,337,000	$167,133,000	$4,430,000	$201,219,000	$4,575,000	$259,761,000	$153,350,000	$399,640,000	$113,532,000	$295,819,000	$80,760,000	$210,378,000	$7,316,000	$19,141,000	$7,402,000	$19,364,000
CA 13. Pt Sur Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 14. San Simeon Beach	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$16,000	$16,000	$12,000	$12,000	$9,000	$9,000	$1,000	$1,000	$1,000	$1,000
CA 15A. Villa Cr Beach	$119,000	$119,000	$128,000	$128,000	$141,000	$141,000	$693,000	$693,000	$524,000	$524,000	$383,000	$383,000	$34,000	$34,000	$35,000	$35,000
CA 15B. Atascadero Beach	$925,000	$4,849,000	$978,000	$5,116,000	$1,052,000	$5,488,000	$10,843,000	$59,637,000	$8,034,000	$44,144,000	$5,721,000	$31,395,000	$521,000	$2,864,000	$528,000	$2,897,000
CA 15C. Morro Bay Beach	$8,470,000	$16,142,000	$8,992,000	$17,132,000	$9,721,000	$18,515,000	$72,936,000	$139,764,000	$54,005,000	$103,461,000	$38,421,000	$73,584,000	$3,503,000	$6,712,000	$3,546,000	$6,791,000
CA 16. Pismo Beach/Nipomo	$15,123,000	$22,170,000	$16,575,000	$23,923,000	$18,800,000	$26,559,000	$101,858,000	$206,048,000	$75,897,000	$153,006,000	$54,484,000	$109,309,000	$4,924,000	$9,926,000	$5,028,000	$10,088,000
CA 17A. Vandenberg North	$2,995,000	$11,478,000	$3,362,000	$12,548,000	$3,942,000	$12,346,000	$10,368,000	$62,040,000	$7,819,000	$46,060,000	$5,692,000	$32,880,000	$507,000	$2,988,000	$525,000	$3,034,000
CA 17B. Vandenberg South	$1,511,000	$9,933,000	$1,695,000	$10,817,000	$1,985,000	$10,319,000	$5,675,000	$57,348,000	$4,271,000	$42,512,000	$3,101,000	$30,290,000	$277,000	$2,758,000	$286,000	$2,795,000
CA 18. Devereaux Beach	$385,000	$1,490,000	$420,000	$1,627,000	$472,000	$1,828,000	$1,619,000	$15,343,000	$1,208,000	$11,490,000	$869,000	$8,294,000	$78,000	$745,000	$80,000	$765,000
CA 19A. Mandalay to Santa Clara	$19,000	$28,000	$21,000	$30,000	$23,000	$33,000	$32,000	$32,000	$24,000	$24,000	$17,000	$17,000	$2,000	$2,000	$2,000	$2,000
CA 19B. Ormond Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19C. Mugu Lagoon	$229,000	$283,000	$256,000	$315,000	$299,000	$365,000	$327,000	$340,000	$258,000	$270,000	$200,000	$212,000	$17,000	$18,000	$18,000	$20,000
CA 19D. Mugu Lagoon S.	$46,000	$56,000	$52,000	$62,000	$61,000	$72,000	$67,000	$68,000	$52,000	$53,000	$40,000	$41,000	$3,000	$3,000	$4,000	$4,000
CA 20. Zuma Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21A. Santa Monica Beach	$0	$0	$0	$0	$0	$0	$6,491,000	$6,491,000	$4,804,000	$4,804,000	$3,415,000	$3,415,000	$312,000	$312,000	$315,000	$315,000
CA 21B. Dockweiler N	$0	$0	$0	$0	$0	$0	$20,363,000	$20,363,000	$15,070,000	$15,070,000	$10,714,000	$10,714,000	$978,000	$978,000	$989,000	$989,000
CA 21C. Dockweiler S	$0	$0	$0	$0	$0	$0	$20,363,000	$20,363,000	$15,070,000	$15,070,000	$10,714,000	$10,714,000	$978,000	$978,000	$989,000	$989,000
CA 21D. Hermosa Beach	$0	$0	$0	$0	$0	$0	$41,793,000	$41,793,000	$30,929,000	$30,929,000	$21,990,000	$21,990,000	$2,006,000	$2,006,000	$2,029,000	$2,029,000
CA 22A. Bolsa Chica Reserve	$14,000	$23,000	$15,000	$24,000	$16,000	$26,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 22B. Huntington St. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 23. Santa Ana River Mouth	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 24. San Onofre St Beach	$41,000	$59,000	$43,000	$62,000	$47,000	$67,000	$14,000	$22,000	$14,000	$22,000	$14,000	$22,000	$1,000	$1,000	$1,000	$2,000
CA 25A Batiquitos West	$5,000	$7,000	$5,000	$8,000	$5,000	$9,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25B. Batiquitos Middle	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25C. Batiquitos East	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

POTENTIAL CRITICAL HABITAT UNITS	Past Impacts (1993-2004) Unadjusted Impacts		Past Impacts (1993-2004) Present Value 3%		Past Impacts (1993-2004) Present Value 7%		Future Impacts (2005-2025) Constant Dollars		Future Impacts (2005-2025) Present Value 3%		Future Impacts (2005-2025) Present Value 7%		Annualized (3%)		Annualized (7%)	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
CA 26. Los Penasquitos	$5,000	$7,000	$5,000	$8,000	$5,000	$9,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27A. North Island N.	$466,000	$475,000	$561,000	$570,000	$724,000	$734,000	$864,000	$864,000	$654,000	$654,000	$477,000	$477,000	$42,000	$42,000	$44,000	$44,000
CA 27B. North Island S.	$268,000	$279,000	$323,000	$334,000	$418,000	$430,000	$505,000	$505,000	$382,000	$382,000	$279,000	$279,000	$25,000	$25,000	$26,000	$26,000
CA 27C. Silver Strand	$2,798,000	$11,924,000	$3,021,000	$12,735,000	$3,352,000	$13,888,000	$18,198,000	$83,034,000	$13,482,000	$61,465,000	$9,599,000	$43,714,000	$875,000	$3,987,000	$886,000	$4,034,000
CA 27D. Delta Beach	$333,000	$344,000	$402,000	$413,000	$520,000	$532,000	$630,000	$630,000	$476,000	$476,000	$348,000	$348,000	$31,000	$31,000	$32,000	$32,000
CA 27E. Sweetwater NWR	$21,000	$51,000	$23,000	$55,000	$25,000	$59,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27F. Tijuana River Beach	$331,000	$334,000	$381,000	$384,000	$459,000	$463,000	$940,000	$940,000	$710,000	$710,000	$519,000	$519,000	$46,000	$46,000	$48,000	$48,000
ALL OREGON (HCP)	$1,202,000	$1,202,000	$1,406,000	$1,406,000	$1,744,000	$1,744,000	$3,043,000	$3,643,000	$2,377,000	$2,823,000	$1,820,000	$2,138,000	$154,000	$183,000	$168,000	$197,000
SUBTOTAL	*$46,583,000*	*$263,389,000*	*$50,664,000*	*$305,137,000*	*$56,932,000*	*$371,426,000*	*$514,906,000*	*$1,222,650,000*	*$382,183,000*	*$906,029,000*	*$272,817,000*	*$645,314,000*	*$24,743,000*	*$58,726,000*	*$25,127,000*	*$59,504,000*
Areas identified for possible inclusion																
WA 1. Copalis Spit	$6,000	$25,000	$7,000	$27,000	$7,000	$29,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 1A. Columbia River Spit	$0	$1,000	$0	$1,000	$0	$1,000	$592,000	$1,493,000	$443,000	$1,111,000	$319,000	$793,000	$29,000	$72,000	$29,000	$73,000
OR 1B. Necanicum River Spit	$0	$1,000	$0	$1,000	$0	$1,000	$574,000	$574,000	$427,000	$427,000	$305,000	$305,000	$28,000	$28,000	$28,000	$28,000
OR 2. Nehalem River Spit	$0	$1,000	$0	$1,000	$0	$1,000	$1,152,000	$2,885,000	$856,000	$2,141,000	$609,000	$1,521,000	$56,000	$139,000	$56,000	$140,000
OR 4. Netarts Spit	$0	$1,000	$0	$1,000	$0	$1,000	$146,000	$449,000	$86,000	$264,000	$44,000	$133,000	$6,000	$17,000	$4,000	$12,000
OR 5A. Sand Lake North	$0	$1,000	$0	$1,000	$0	$1,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 5B. Sand Lake South	$0	$1,000	$0	$1,000	$0	$1,000	$807,000	$1,206,000	$554,000	$828,000	$350,000	$522,000	$36,000	$54,000	$32,000	$48,000
OR 6. Nestucca River Spit	$0	$1,000	$0	$1,000	$0	$1,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8C. N Umpqua River Spit	$130,000	$131,000	$154,000	$154,000	$192,000	$193,000	$577,000	$581,000	$391,000	$394,000	$246,000	$248,000	$25,000	$26,000	$23,000	$23,000
OR 10B. Sixes River Spit	$0	$1,000	$0	$1,000	$0	$1,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 10C. Elk River Spit	$0	$1,000	$0	$1,000	$0	$1,000	$294,000	$365,000	$187,000	$232,000	$105,000	$131,000	$12,000	$15,000	$10,000	$12,000
OR 11. Euchre Creek Spit	$0	$1,000	$0	$1,000	$0	$1,000	$289,000	$305,000	$183,000	$194,000	$103,000	$109,000	$12,000	$13,000	$10,000	$10,000
OR 12. Pistol River Spit	$0	$1,000	$0	$1,000	$0	$1,000	$146,000	$174,000	$86,000	$102,000	$44,000	$52,000	$6,000	$7,000	$4,000	$5,000
CA 11A. Waddell Cr Beach	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$16,000	$16,000	$12,000	$12,000	$9,000	$9,000	$1,000	$1,000	$1,000	$1,000
SUBTOTAL	*$141,000*	*$167,000*	*$166,000*	*$193,000*	*$205,000*	*$235,000*	*$4,591,000*	*$8,048,000*	*$3,226,000*	*$5,706,000*	*$2,133,000*	*$3,822,000*	*$209,000*	*$370,000*	*$197,000*	*$353,000*
Areas proposed for exclusion																
Salinas River National Wildlife Refuge	$739,000	$748,000	$858,000	$868,000	$1,054,000	$1,065,000	$3,587,000	$3,587,000	$2,712,000	$2,712,000	$1,980,000	$1,980,000	$176,000	$176,000	$183,000	$183,000
Guadalupe/Nipomo Dunes National Wildlife Refuge	$261,000	$271,000	$283,000	$293,000	$315,000	$326,000	$1,103,000	$1,103,000	$834,000	$834,000	$609,000	$609,000	$54,000	$54,000	$56,000	$56,000
San Diego	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Marine Corps Base Camp Pendleton	$944,000	$944,000	$1,111,000	$1,111,000	$1,396,000	$1,396,000	$2,488,000	$2,488,000	$2,013,000	$2,013,000	$1,374,000	$1,374,000	$131,000	$131,000	$127,000	$127,000
Naval Amphibious Base	$558,000	$558,000	$674,000	$674,000	$873,000	$873,000	$1,067,000	$1,067,000	$806,000	$806,000	$589,000	$589,000	$52,000	$52,000	$54,000	$54,000
San Francisco Bay	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	*$2,502,000*	*$2,521,000*	*$2,927,000*	*$2,947,000*	*$3,638,000*	*$3,659,000*	*$8,244,000*	*$8,244,000*	*$6,365,000*	*$6,365,000*	*$4,552,000*	*$4,552,000*	*$413,000*	*$413,000*	*$420,000*	*$420,000*

APPENDIX C:

MANAGEMENT IMPACTS BY UNIT

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APPENDIX C: IMPACTS TO MANAGEMENT ACTIVITIES BY UNIT

C.1 California State Parks

C.1.1 Impacts in 14 CA State Parks Potential Critical Habitat Units

Exhibit C-1 **California State Parks Plover Management Costs in 14 Potential Critical Habitat Units**	
Annual past costs in 14 units from 2001 to 2004	$270,000
Estimated annual future costs in 14 units from 2005 to 2025	$300,000
Total number of nests in 14 CA State Parks potential critical habitat areas	400
Past per nest cost of management	$675
Future per nest cost of management	$750

Past Impacts

Exhibit C-2
Past Impacts of CA State Parks Plover Management per Unit in 14 Potential Critical Habitat Areas (Constant Dollars)

Year	CA 3A	CA 6	CA 10	CA 11A	CA 11C	CA 12A	CA 12C	CA 14	CA 15A	CA 15B	CA 15C	CA 19A	CA 27C	CA 27F	TOTAL (Constant Dollars)
Nest #	*10*	*0*	*4*	*1*	*4*	*81*	*64*	*1*	*44*	*37*	*109*	*2*	*24*	*19*	*400*
2001	$7,000	$0	$3,000	$1,000	$3,000	$55,000	$43,000	$1,000	$30,000	$25,000	$74,000	$1,000	$16,000	$13,000	$270,000
2002	$7,000	$0	$3,000	$1,000	$3,000	$55,000	$43,000	$1,000	$30,000	$25,000	$74,000	$1,000	$16,000	$13,000	$270,000
2003	$7,000	$0	$3,000	$1,000	$3,000	$55,000	$43,000	$1,000	$30,000	$25,000	$74,000	$1,000	$16,000	$13,000	$270,000
2004	$7,000	$0	$3,000	$1,000	$3,000	$55,000	$43,000	$1,000	$30,000	$25,000	$74,000	$1,000	$16,000	$13,000	$270,000

Exhibit C-3
Present Value of Past Impacts of CA State Parks Plover Management per Unit in 14 Potential Critical Habitat Areas (3% Discount Rate)

Year	CA 3A	CA 6	CA 10	CA 11A	CA 11C	CA 12A	CA 12C	CA 14	CA 15A	CA 15B	CA 15C	CA 19A	CA 27C	CA 27F	TOTAL (3%)
2001	$8,000	$0	$3,000	$1,000	$3,000	$62,000	$49,000	$1,000	$33,000	$28,000	$83,000	$2,000	$18,000	$14,000	$304,000
2002	$7,000	$0	$3,000	$1,000	$3,000	$60,000	$47,000	$1,000	$32,000	$27,000	$80,000	$1,000	$18,000	$14,000	$295,000
2003	$7,000	$0	$3,000	$1,000	$3,000	$58,000	$46,000	$1,000	$32,000	$26,000	$78,000	$1,000	$17,000	$14,000	$286,000
2004	$7,000	$0	$3,000	$1,000	$3,000	$56,000	$44,000	$1,000	$31,000	$26,000	$76,000	$1,000	$17,000	$13,000	$278,000
Total	$29,000	$0	$12,000	$3,000	$12,000	$236,000	$186,000	$3,000	$128,000	$108,000	$317,000	$6,000	$70,000	$55,000	$1,163,000

Exhibit C-4
Present Value of Past Impacts of CA State Parks Plover Management per Unit in 14 Potential Critical Habitat Areas (7% Discount Rate)

Year	CA 3A	CA 6	CA 10	CA 11A	CA 11C	CA 12A	CA 12C	CA 14	CA 15A	CA 15B	CA 15C	CA 19A	CA 27C	CA 27F	TOTAL (7%)
2001	$9,000	$0	$4,000	$1,000	$4,000	$72,000	$57,000	$1,000	$39,000	$33,000	$96,000	$2,000	$21,000	$17,000	$354,000
2002	$8,000	$0	$3,000	$1,000	$3,000	$67,000	$53,000	$1,000	$36,000	$31,000	$90,000	$2,000	$20,000	$16,000	$331,000
2003	$8,000	$0	$3,000	$1,000	$3,000	$63,000	$49,000	$1,000	$34,000	$29,000	$84,000	$2,000	$19,000	$15,000	$309,000
2004	$7,000	$0	$3,000	$1,000	$3,000	$59,000	$46,000	$1,000	$32,000	$27,000	$79,000	$1,000	$17,000	$14,000	$289,000
Total	$32,000	$0	$13,000	$3,000	$13,000	$260,000	$205,000	$3,000	$141,000	$119,000	$350,000	$6,000	$77,000	$61,000	$1,283,000

Future Impacts

Exhibit C-5
Future Impacts of CA State Parks Plover Management per Unit in 14 Potential Critical Habitat Areas (Constant Dollars)

Year	CA 3A	CA 6	CA 10	CA 11A	CA 11C	CA 12A	CA 12C	CA 14	CA 15A	CA 15B	CA 15C	CA 19A	CA 27C	CA 27F	TOTAL (Constant Dollars)
2005	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2006	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2007	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2008	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2009	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2010	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2011	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2012	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2013	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2014	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2015	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2016	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2017	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2018	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2019	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2020	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2021	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2022	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2023	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2024	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2025	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000

Exhibit C-6
Present Value of Future Impacts of CA State Parks Plover Management per Unit in 14 Potential Critical Habitat Areas (3% Discount Rate)

Year	CA 3A	CA 6	CA 10	CA 11A	CA 11C	CA 12A	CA 12C	CA 14	CA 15A	CA 15B	CA 15C	CA 19A	CA 27C	CA 27F	TOTAL (3%)
2005	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2006	$7,000	$0	$3,000	$1,000	$3,000	$59,000	$47,000	$1,000	$32,000	$27,000	$79,000	$1,000	$17,000	$14,000	$291,000
2007	$7,000	$0	$3,000	$1,000	$3,000	$57,000	$45,000	$1,000	$31,000	$26,000	$77,000	$1,000	$17,000	$13,000	$283,000
2008	$7,000	$0	$3,000	$1,000	$3,000	$56,000	$44,000	$1,000	$30,000	$25,000	$75,000	$1,000	$16,000	$13,000	$275,000
2009	$7,000	$0	$3,000	$1,000	$3,000	$54,000	$43,000	$1,000	$29,000	$25,000	$73,000	$1,000	$16,000	$13,000	$267,000
2010	$6,000	$0	$3,000	$1,000	$3,000	$52,000	$41,000	$1,000	$28,000	$24,000	$71,000	$1,000	$16,000	$12,000	$259,000
2011	$6,000	$0	$3,000	$1,000	$3,000	$51,000	$40,000	$1,000	$28,000	$23,000	$68,000	$1,000	$15,000	$12,000	$251,000
2012	$6,000	$0	$2,000	$1,000	$2,000	$49,000	$39,000	$1,000	$27,000	$23,000	$66,000	$1,000	$15,000	$12,000	$244,000
2013	$6,000	$0	$2,000	$1,000	$2,000	$48,000	$38,000	$1,000	$26,000	$22,000	$65,000	$1,000	$14,000	$11,000	$237,000
2014	$6,000	$0	$2,000	$1,000	$2,000	$47,000	$37,000	$1,000	$25,000	$21,000	$63,000	$1,000	$14,000	$11,000	$230,000
2015	$6,000	$0	$2,000	$1,000	$2,000	$45,000	$36,000	$1,000	$25,000	$21,000	$61,000	$1,000	$13,000	$11,000	$223,000
2016	$5,000	$0	$2,000	$1,000	$2,000	$44,000	$35,000	$1,000	$24,000	$20,000	$59,000	$1,000	$13,000	$10,000	$217,000
2017	$5,000	$0	$2,000	$1,000	$2,000	$43,000	$34,000	$1,000	$23,000	$19,000	$57,000	$1,000	$13,000	$10,000	$210,000
2018	$5,000	$0	$2,000	$1,000	$2,000	$41,000	$33,000	$1,000	$22,000	$19,000	$56,000	$1,000	$12,000	$10,000	$204,000
2019	$5,000	$0	$2,000	$0	$2,000	$40,000	$32,000	$0	$22,000	$18,000	$54,000	$1,000	$12,000	$9,000	$198,000
2020	$5,000	$0	$2,000	$0	$2,000	$39,000	$31,000	$0	$21,000	$18,000	$52,000	$1,000	$12,000	$9,000	$193,000
2021	$5,000	$0	$2,000	$0	$2,000	$38,000	$30,000	$0	$21,000	$17,000	$51,000	$1,000	$11,000	$9,000	$187,000
2022	$5,000	$0	$2,000	$0	$2,000	$37,000	$29,000	$0	$20,000	$17,000	$49,000	$1,000	$11,000	$9,000	$182,000
2023	$4,000	$0	$2,000	$0	$2,000	$36,000	$28,000	$0	$19,000	$16,000	$48,000	$1,000	$11,000	$8,000	$176,000
2024	$4,000	$0	$2,000	$0	$2,000	$35,000	$27,000	$0	$19,000	$16,000	$47,000	$1,000	$10,000	$8,000	$171,000
2025	$4,000	$0	$2,000	$0	$2,000	$34,000	$27,000	$0	$18,000	$15,000	$45,000	$1,000	$10,000	$8,000	$166,000
Total	$119,000	$0	$48,000	$12,000	$48,000	$965,000	$762,000	$12,000	$524,000	$441,000	$1,298,000	$24,000	$286,000	$226,000	$4,763,000
Annualized	$8,000	$0	$3,000	$1,000	$3,000	$63,000	$49,000	$1,000	$34,000	$29,000	$84,000	$2,000	$19,000	$15,000	$309,000

Exhibit C-7
Present Value of Future Impacts of CA State Parks Plover Management per Unit in 14 Potential Critical Habitat Areas (7% Discount Rate)

Year	CA 3A	CA 6	CA 10	CA 11A	CA 11C	CA 12A	CA 12C	CA 14	CA 15A	CA 15B	CA 15C	CA 19A	CA 27C	CA 27F	TOTAL (7%)
2005	$8,000	$0	$3,000	$1,000	$3,000	$61,000	$48,000	$1,000	$33,000	$28,000	$82,000	$2,000	$18,000	$14,000	$300,000
2006	$7,000	$0	$3,000	$1,000	$3,000	$57,000	$45,000	$1,000	$31,000	$26,000	$76,000	$1,000	$17,000	$13,000	$280,000
2007	$7,000	$0	$3,000	$1,000	$3,000	$53,000	$42,000	$1,000	$29,000	$24,000	$71,000	$1,000	$16,000	$12,000	$262,000
2008	$6,000	$0	$2,000	$1,000	$2,000	$50,000	$39,000	$1,000	$27,000	$23,000	$67,000	$1,000	$15,000	$12,000	$245,000
2009	$6,000	$0	$2,000	$1,000	$2,000	$46,000	$37,000	$1,000	$25,000	$21,000	$62,000	$1,000	$14,000	$11,000	$229,000
2010	$5,000	$0	$2,000	$1,000	$2,000	$43,000	$34,000	$1,000	$24,000	$20,000	$58,000	$1,000	$13,000	$10,000	$214,000
2011	$5,000	$0	$2,000	$0	$2,000	$40,000	$32,000	$0	$22,000	$18,000	$54,000	$1,000	$12,000	$9,000	$200,000
2012	$5,000	$0	$2,000	$0	$2,000	$38,000	$30,000	$0	$21,000	$17,000	$51,000	$1,000	$11,000	$9,000	$187,000
2013	$4,000	$0	$2,000	$0	$2,000	$35,000	$28,000	$0	$19,000	$16,000	$48,000	$1,000	$10,000	$8,000	$175,000
2014	$4,000	$0	$2,000	$0	$2,000	$33,000	$26,000	$0	$18,000	$15,000	$44,000	$1,000	$10,000	$8,000	$163,000
2015	$4,000	$0	$2,000	$0	$2,000	$31,000	$24,000	$0	$17,000	$14,000	$42,000	$1,000	$9,000	$7,000	$153,000
2016	$4,000	$0	$1,000	$0	$1,000	$29,000	$23,000	$0	$16,000	$13,000	$39,000	$1,000	$9,000	$7,000	$143,000
2017	$3,000	$0	$1,000	$0	$1,000	$27,000	$21,000	$0	$15,000	$12,000	$36,000	$1,000	$8,000	$6,000	$133,000
2018	$3,000	$0	$1,000	$0	$1,000	$25,000	$20,000	$0	$14,000	$12,000	$34,000	$1,000	$7,000	$6,000	$124,000
2019	$3,000	$0	$1,000	$0	$1,000	$24,000	$19,000	$0	$13,000	$11,000	$32,000	$1,000	$7,000	$6,000	$116,000
2020	$3,000	$0	$1,000	$0	$1,000	$22,000	$17,000	$0	$12,000	$10,000	$30,000	$1,000	$7,000	$5,000	$109,000
2021	$3,000	$0	$1,000	$0	$1,000	$21,000	$16,000	$0	$11,000	$9,000	$28,000	$1,000	$6,000	$5,000	$102,000
2022	$2,000	$0	$1,000	$0	$1,000	$19,000	$15,000	$0	$10,000	$9,000	$26,000	$0	$6,000	$5,000	$95,000
2023	$2,000	$0	$1,000	$0	$1,000	$18,000	$14,000	$0	$10,000	$8,000	$24,000	$0	$5,000	$4,000	$89,000
2024	$2,000	$0	$1,000	$0	$1,000	$17,000	$13,000	$0	$9,000	$8,000	$23,000	$0	$5,000	$4,000	$83,000
2025	$2,000	$0	$1,000	$0	$1,000	$16,000	$12,000	$0	$9,000	$7,000	$21,000	$0	$5,000	$4,000	$78,000
Total	$87,000	$0	$35,000	$9,000	$35,000	$704,000	$557,000	$9,000	$383,000	$322,000	$948,000	$17,000	$209,000	$165,000	$3,478,000
Annualized	$8,000	$0	$3,000	$1,000	$3,000	$65,000	$51,000	$1,000	$35,000	$30,000	$87,000	$2,000	$19,000	$15,000	$321,000

C.1.2 Oceano Dunes State Vehicular Recreation Area (Unit CA 16)

Past Impacts

Exhibit C-8
Past Impacts of Plover Management at Oceano Dunes SVRA

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
1993	$200,000	$200,000	$285,000	$285,000	$450,000	$450,000
1994	$200,000	$200,000	$277,000	$277,000	$421,000	$421,000
1995	$200,000	$200,000	$269,000	$269,000	$393,000	$393,000
1996	$200,000	$200,000	$261,000	$261,000	$368,000	$368,000
1997	$200,000	$200,000	$253,000	$253,000	$344,000	$344,000
1998	$200,000	$200,000	$246,000	$246,000	$321,000	$321,000
1999	$200,000	$200,000	$239,000	$239,000	$300,000	$300,000
2000	$200,000	$200,000	$232,000	$232,000	$281,000	$281,000
2001	$750,000	$750,000	$844,000	$844,000	$983,000	$983,000
2002	$750,000	$750,000	$820,000	$820,000	$919,000	$919,000
2003	$750,000	$750,000	$796,000	$796,000	$859,000	$859,000
2004	$750,000	$750,000	$773,000	$773,000	$803,000	$803,000
Total			$5,294,000	$5,294,000	$6,441,000	$6,441,000

Notes: Past plover management costs at Oceano Dunes included fencing, predator management, and construction of exclosures. Plover management efforts increased in 2001 as a result of a settlement with the Sierra Club.

Future Impacts

Exhibit C-9
Future Impacts of Plover Management at Oceano Dunes SVRA

Year	Constant Dollars		Present Value (3%)		Present Value (7%)	
	Low	High	Low	High	Low	High
2005	$1,750,000	$1,750,000	$1,750,000	$1,750,000	$1,750,000	$1,750,000
2006	$750,000	$750,000	$728,000	$728,000	$701,000	$701,000
2007	$750,000	$750,000	$707,000	$707,000	$655,000	$655,000
2008	$750,000	$750,000	$686,000	$686,000	$612,000	$612,000
2009	$750,000	$750,000	$666,000	$666,000	$572,000	$572,000
2010	$750,000	$750,000	$647,000	$647,000	$535,000	$535,000
2011	$750,000	$750,000	$628,000	$628,000	$500,000	$500,000
2012	$750,000	$750,000	$610,000	$610,000	$467,000	$467,000
2013	$750,000	$750,000	$592,000	$592,000	$437,000	$437,000
2014	$750,000	$750,000	$575,000	$575,000	$408,000	$408,000
2015	$750,000	$750,000	$558,000	$558,000	$381,000	$381,000
2016	$750,000	$750,000	$542,000	$542,000	$356,000	$356,000
2017	$750,000	$750,000	$526,000	$526,000	$333,000	$333,000
2018	$750,000	$750,000	$511,000	$511,000	$311,000	$311,000
2019	$750,000	$750,000	$496,000	$496,000	$291,000	$291,000
2020	$750,000	$750,000	$481,000	$481,000	$272,000	$272,000
2021	$750,000	$750,000	$467,000	$467,000	$254,000	$254,000
2022	$750,000	$750,000	$454,000	$454,000	$237,000	$237,000
2023	$750,000	$750,000	$441,000	$441,000	$222,000	$222,000
2024	$750,000	$750,000	$428,000	$428,000	$207,000	$207,000
2025	$750,000	$750,000	$415,000	$415,000	$194,000	$194,000
Total			$12,908,000	$12,908,000	$9,696,000	$9,696,000
Annualized			$837,000	$837,000	$895,000	$895,000

Notes: Future impacts of plover management at Oceano Dunes are generated by predator management, fencing, and exclosure construction efforts. Also included is $1 million in 2001 for development of a Habitat Conservation Plan.

C.2 California Department of Fish and Game

C.2.1 Eel River Wildlife Area (Units CA 4A and 4B)

Past Impacts

Exhibit C-10
Past Impacts of Plover Management at Eel River Wildlife Area Per Unit (impacts apply to both Unit 4A and 4B)

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2002	$7,500	$7,500	$8,000	$8,000	$9,000	$9,000
2003	$7,500	$7,500	$8,000	$8,000	$9,000	$9,000
2004	$7,500	$7,500	$8,000	$8,000	$8,000	$8,000
Total			$24,000	$24,000	$26,000	$26,000

Notes: Past costs of plover management are attributable to CA DFG monitoring efforts. These full impacts are due to efforts in each of Units CA 4A and 4B.

Future Impacts

Exhibit C-11
Future Impacts of Plover Management at Eel River Wildlife Area Per Unit (impacts apply to both Unit 4A and 4B)

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$7,500	$7,500	$8,000	$8,000	$8,000	$8,000
2006	$7,500	$7,500	$7,000	$7,000	$7,000	$7,000
2007	$7,500	$7,500	$7,000	$7,000	$7,000	$7,000
2008	$7,500	$7,500	$7,000	$7,000	$6,000	$6,000
2009	$7,500	$7,500	$7,000	$7,000	$6,000	$6,000
2010	$7,500	$7,500	$6,000	$6,000	$5,000	$5,000
2011	$7,500	$7,500	$6,000	$6,000	$5,000	$5,000
2012	$7,500	$7,500	$6,000	$6,000	$5,000	$5,000
2013	$7,500	$7,500	$6,000	$6,000	$4,000	$4,000
2014	$7,500	$7,500	$6,000	$6,000	$4,000	$4,000
2015	$7,500	$7,500	$6,000	$6,000	$4,000	$4,000
2016	$7,500	$7,500	$5,000	$5,000	$4,000	$4,000
2017	$7,500	$7,500	$5,000	$5,000	$3,000	$3,000
2018	$7,500	$7,500	$5,000	$5,000	$3,000	$3,000
2019	$7,500	$7,500	$5,000	$5,000	$3,000	$3,000
2020	$7,500	$7,500	$5,000	$5,000	$3,000	$3,000
2021	$7,500	$7,500	$5,000	$5,000	$3,000	$3,000
2022	$7,500	$7,500	$5,000	$5,000	$2,000	$2,000
2023	$7,500	$7,500	$4,000	$4,000	$2,000	$2,000
2024	$7,500	$7,500	$4,000	$4,000	$2,000	$2,000
2025	$7,500	$7,500	$4,000	$4,000	$2,000	$2,000
Total			$119,000	$119,000	$87,000	$87,000
Annualized			$8,000	$8,000	$8,000	$8,000

Notes: Future costs of plover management are attributable to CA DFG monitoring efforts. These full impacts are expected to be incurred due to efforts in each of Units CA 4A and 4B.

C.2.2 Moss Landing Wildlife Area (Units CA 12C)

Past Impacts

Exhibit C-12
Past Impacts of Plover Management at Moss Landing Wildlife Area (Unit 12C)

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
1995	$33,000	$33,000	$44,000	$44,000	$64,000	$64,000
1996	$33,000	$33,000	$42,000	$42,000	$60,000	$60,000
1997	$33,000	$33,000	$41,000	$41,000	$56,000	$56,000
1998	$33,000	$33,000	$40,000	$40,000	$52,000	$52,000
1999	$33,000	$33,000	$39,000	$39,000	$49,000	$49,000
2000	$33,000	$33,000	$38,000	$38,000	$46,000	$46,000
2001	$33,000	$33,000	$37,000	$37,000	$43,000	$43,000
2002	$33,000	$33,000	$36,000	$36,000	$40,000	$40,000
2003	$43,000	$43,000	$45,000	$45,000	$49,000	$49,000
2004	$33,000	$33,000	$34,000	$34,000	$35,000	$35,000
Total			$395,000	$395,000	$493,000	$493,000

Notes: Pasts costs to CA DFG include annual monitoring, predator management, fencing, signage, management of non-native vegetation, and development of the salt pond management plan in 2003.

Future Impacts

Exhibit C-13 Future Impacts of Plover Management at Moss Landing Wildlife Area (Unit 12C)						
	Constant Dollars		**Present Value (3%)**		**Present Value (7%)**	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$33,000	$33,000	$33,000	$33,000	$33,000	$33,000
2006	$33,000	$33,000	$32,000	$32,000	$30,000	$30,000
2007	$33,000	$33,000	$31,000	$31,000	$28,000	$28,000
2008	$33,000	$33,000	$30,000	$30,000	$27,000	$27,000
2009	$33,000	$33,000	$29,000	$29,000	$25,000	$25,000
2010	$33,000	$33,000	$28,000	$28,000	$23,000	$23,000
2011	$33,000	$33,000	$27,000	$27,000	$22,000	$22,000
2012	$33,000	$33,000	$26,000	$26,000	$20,000	$20,000
2013	$33,000	$33,000	$26,000	$26,000	$19,000	$19,000
2014	$33,000	$33,000	$25,000	$25,000	$18,000	$18,000
2015	$33,000	$33,000	$24,000	$24,000	$17,000	$17,000
2016	$33,000	$33,000	$24,000	$24,000	$15,000	$15,000
2017	$33,000	$33,000	$23,000	$23,000	$14,000	$14,000
2018	$33,000	$33,000	$22,000	$22,000	$14,000	$14,000
2019	$33,000	$33,000	$22,000	$22,000	$13,000	$13,000
2020	$33,000	$33,000	$21,000	$21,000	$12,000	$12,000
2021	$33,000	$33,000	$20,000	$20,000	$11,000	$11,000
2022	$33,000	$33,000	$20,000	$20,000	$10,000	$10,000
2023	$33,000	$33,000	$19,000	$19,000	$10,000	$10,000
2024	$33,000	$33,000	$19,000	$19,000	$9,000	$9,000
2025	$33,000	$33,000	$18,000	$18,000	$8,000	$8,000
Total			$517,000	$517,000	$378,000	$378,000
Annualized			$34,000	$34,000	$35,000	$35,000
Notes: Pasts costs to CA DFG include annual monitoring, predator management, fencing, signage, and management of non-native vegetation.						

C.3 Bureau of Land Management (BLM), Arcata

C.3.1 Humboldt Bay South Spit (Unit CA 4A)

Past Impacts

Exhibit C-14 Past Impacts of Plover Management at Humboldt Bay South Spit (Unit CA 4A)						
	Constant Dollars		**Present Value (3%)**		**Present Value (7%)**	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2003	$35,000	$35,000	$37,000	$37,000	$40,000	$40,000
2004	$35,000	$35,000	$36,000	$36,000	$37,000	$37,000
Total			$73,000	$73,000	$78,000	$78,000
Notes: Pasts costs of plover management to BLM including annual monitoring, fencing, restoration, chick banding, and enforcement.						

Future Impacts

Exhibit C-15
Future Impacts of Plover Management at Humboldt Bay South Spit (Unit CA 4A)

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$35,000	$35,000	$35,000	$35,000	$35,000	$35,000
2006	$35,000	$35,000	$34,000	$34,000	$33,000	$33,000
2007	$35,000	$35,000	$33,000	$33,000	$31,000	$31,000
2008	$35,000	$35,000	$32,000	$32,000	$29,000	$29,000
2009	$35,000	$35,000	$31,000	$31,000	$27,000	$27,000
2010	$35,000	$35,000	$30,000	$30,000	$25,000	$25,000
2011	$35,000	$35,000	$29,000	$29,000	$23,000	$23,000
2012	$35,000	$35,000	$28,000	$28,000	$22,000	$22,000
2013	$35,000	$35,000	$28,000	$28,000	$20,000	$20,000
2014	$35,000	$35,000	$27,000	$27,000	$19,000	$19,000
2015	$35,000	$35,000	$26,000	$26,000	$18,000	$18,000
2016	$35,000	$35,000	$25,000	$25,000	$17,000	$17,000
2017	$35,000	$35,000	$25,000	$25,000	$16,000	$16,000
2018	$35,000	$35,000	$24,000	$24,000	$15,000	$15,000
2019	$35,000	$35,000	$23,000	$23,000	$14,000	$14,000
2020	$35,000	$35,000	$22,000	$22,000	$13,000	$13,000
2021	$35,000	$35,000	$22,000	$22,000	$12,000	$12,000
2022	$35,000	$35,000	$21,000	$21,000	$11,000	$11,000
2023	$35,000	$35,000	$21,000	$21,000	$10,000	$10,000
2024	$35,000	$35,000	$20,000	$20,000	$10,000	$10,000
2025	$35,000	$35,000	$19,000	$19,000	$9,000	$9,000
Total			$556,000	$556,000	$406,000	$406,000
Annualized			$36,000	$36,000	$37,000	$37,000

Notes: Pasts costs of plover management to BLM including annual monitoring, fencing, restoration, chick banding, and enforcement.

C.4 U.S. Fish and Wildlife Service (Service)

C.4.1 Tijuana Slough National Wildlife Refuge (Unit CA 27F)

Past Impacts

Exhibit C-16
Past Impacts of Plover Management at Tijuana Slough NWR (CA 27F)

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
1996	$30,000	$30,000	$39,000	$39,000	$55,000	$55,000
1997	$30,000	$30,000	$38,000	$38,000	$52,000	$52,000
1998	$30,000	$30,000	$37,000	$37,000	$48,000	$48,000
1999	$30,000	$30,000	$36,000	$36,000	$45,000	$45,000
2000	$30,000	$30,000	$35,000	$35,000	$42,000	$42,000
2001	$30,000	$30,000	$34,000	$34,000	$39,000	$39,000
2002	$30,000	$30,000	$33,000	$33,000	$37,000	$37,000
2003	$30,000	$30,000	$32,000	$32,000	$34,000	$34,000
2004	$30,000	$30,000	$31,000	$31,000	$32,000	$32,000
Total			$314,000	$314,000	$384,000	$384,000

Notes: Past costs to the Service are for plover monitoring.

Future Impacts

Exhibit C-17
Future Impacts of Plover Management at Tijuana Slough NWR (CA 27F)

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000
2006	$30,000	$30,000	$29,000	$29,000	$28,000	$28,000
2007	$30,000	$30,000	$28,000	$28,000	$26,000	$26,000
2008	$30,000	$30,000	$27,000	$27,000	$24,000	$24,000
2009	$30,000	$30,000	$27,000	$27,000	$23,000	$23,000
2010	$30,000	$30,000	$26,000	$26,000	$21,000	$21,000
2011	$30,000	$30,000	$25,000	$25,000	$20,000	$20,000
2012	$30,000	$30,000	$24,000	$24,000	$19,000	$19,000
2013	$30,000	$30,000	$24,000	$24,000	$17,000	$17,000
2014	$30,000	$30,000	$23,000	$23,000	$16,000	$16,000
2015	$30,000	$30,000	$22,000	$22,000	$15,000	$15,000
2016	$30,000	$30,000	$22,000	$22,000	$14,000	$14,000
2017	$30,000	$30,000	$21,000	$21,000	$13,000	$13,000
2018	$30,000	$30,000	$20,000	$20,000	$12,000	$12,000
2019	$30,000	$30,000	$20,000	$20,000	$12,000	$12,000
2020	$30,000	$30,000	$19,000	$19,000	$11,000	$11,000
2021	$30,000	$30,000	$19,000	$19,000	$10,000	$10,000
2022	$30,000	$30,000	$18,000	$18,000	$9,000	$9,000
2023	$30,000	$30,000	$18,000	$18,000	$9,000	$9,000
2024	$30,000	$30,000	$17,000	$17,000	$8,000	$8,000
2025	$30,000	$30,000	$17,000	$17,000	$8,000	$8,000
Total			$476,000	$476,000	$348,000	$348,000
Annualized			$31,000	$31,000	$32,000	$32,000

Notes: Future costs to the Service are for plover monitoring.

C.4.2 Salinas River National Wildlife Refuge (Proposed for Exclusion)

Past Impacts

Exhibit C-18
Past Impacts of Plover Management at Salinas River NWR

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
1993	$12,800	$12,800	$18,000	$18,000	$29,000	$29,000
1994	$12,800	$12,800	$18,000	$18,000	$27,000	$27,000
1995	$52,800	$52,800	$71,000	$71,000	$104,000	$104,000
1996	$52,800	$52,800	$69,000	$69,000	$97,000	$97,000
1997	$52,800	$52,800	$67,000	$67,000	$91,000	$91,000
1998	$52,800	$52,800	$65,000	$65,000	$85,000	$85,000
1999	$52,800	$52,800	$63,000	$63,000	$79,000	$79,000
2000	$52,800	$52,800	$61,000	$61,000	$74,000	$74,000
2001	$52,800	$52,800	$59,000	$59,000	$69,000	$69,000
2002	$148,400	$148,400	$162,000	$162,000	$182,000	$182,000
2003	$84,400	$84,400	$90,000	$90,000	$97,000	$97,000
2004	$84,400	$84,400	$87,000	$87,000	$90,000	$90,000
Total			$830,000	$830,000	$1,023,000	$1,023,000

Notes: Impacts from 1993 to 1994 include plover monitoring; from 1995 to 2001 impacts were generated by plover monitoring and predator management. In 2002, the Service was impacted by plover monitoring, predator management, fencing, and $70,000 for management plan development. From 2003 to 2004, the Service conducted plover monitoring, predator management, and fencing.

Future Impacts

Exhibit C-19
Future Impacts of Plover Management at Salinas River NWR

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$171,000	$171,000	$171,000	$171,000	$171,000	$171,000
2006	$171,000	$171,000	$166,000	$166,000	$160,000	$160,000
2007	$171,000	$171,000	$161,000	$161,000	$149,000	$149,000
2008	$171,000	$171,000	$156,000	$156,000	$139,000	$139,000
2009	$171,000	$171,000	$152,000	$152,000	$130,000	$130,000
2010	$171,000	$171,000	$147,000	$147,000	$122,000	$122,000
2011	$171,000	$171,000	$143,000	$143,000	$114,000	$114,000
2012	$171,000	$171,000	$139,000	$139,000	$106,000	$106,000
2013	$171,000	$171,000	$135,000	$135,000	$99,000	$99,000
2014	$171,000	$171,000	$131,000	$131,000	$93,000	$93,000
2015	$171,000	$171,000	$127,000	$127,000	$87,000	$87,000
2016	$171,000	$171,000	$123,000	$123,000	$81,000	$81,000
2017	$171,000	$171,000	$120,000	$120,000	$76,000	$76,000
2018	$171,000	$171,000	$116,000	$116,000	$71,000	$71,000
2019	$171,000	$171,000	$113,000	$113,000	$66,000	$66,000
2020	$171,000	$171,000	$110,000	$110,000	$62,000	$62,000
2021	$171,000	$171,000	$106,000	$106,000	$58,000	$58,000
2022	$171,000	$171,000	$103,000	$103,000	$54,000	$54,000
2023	$171,000	$171,000	$100,000	$100,000	$51,000	$51,000
2024	$171,000	$171,000	$97,000	$97,000	$47,000	$47,000
2025	$171,000	$171,000	$95,000	$95,000	$44,000	$44,000
Total			$2,712,000	$2,712,000	$1,980,000	$1,980,000
Annualized			$176,000	$176,000	$183,000	$183,000

Notes: Future costs to the Service are for plover monitoring, predator management, and fencing.

C.4.3 Guadalupe-Nipomo Dunes National Wildlife Refuge (Proposed for Exclusion)

Past Impacts

Exhibit C-20
Past Impacts of Plover Management at Guadalupe-Nipomo Dunes NWR

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2000	$25,000	$25,000	$29,000	$29,000	$35,000	$35,000
2001	$53,000	$53,000	$59,000	$59,000	$69,000	$69,000
2002	$53,000	$53,000	$57,000	$57,000	$64,000	$64,000
2003	$53,000	$53,000	$56,000	$56,000	$60,000	$60,000
2004	$53,000	$53,000	$54,000	$54,000	$56,000	$56,000
Total			$255,000	$255,000	$284,000	$284,000

Notes: Pasts costs to the Service include development of environmental assessment in 2000, and costs of monitoring, fencing and volunteer program implementation from 2001 to 2004.

Future Impacts

Exhibit C-21
Future Impacts of Plover Management at Guadalupe-Nipomo Dunes NWR

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$53,000	$53,000	$53,000	$53,000	$53,000	$53,000
2006	$53,000	$53,000	$51,000	$51,000	$49,000	$49,000
2007	$53,000	$53,000	$49,000	$49,000	$46,000	$46,000
2008	$53,000	$53,000	$48,000	$48,000	$43,000	$43,000
2009	$53,000	$53,000	$47,000	$47,000	$40,000	$40,000
2010	$53,000	$53,000	$45,000	$45,000	$37,000	$37,000
2011	$53,000	$53,000	$44,000	$44,000	$35,000	$35,000
2012	$53,000	$53,000	$43,000	$43,000	$33,000	$33,000
2013	$53,000	$53,000	$41,000	$41,000	$31,000	$31,000
2014	$53,000	$53,000	$40,000	$40,000	$29,000	$29,000
2015	$53,000	$53,000	$39,000	$39,000	$27,000	$27,000
2016	$53,000	$53,000	$38,000	$38,000	$25,000	$25,000
2017	$53,000	$53,000	$37,000	$37,000	$23,000	$23,000
2018	$53,000	$53,000	$36,000	$36,000	$22,000	$22,000
2019	$53,000	$53,000	$35,000	$35,000	$20,000	$20,000
2020	$53,000	$53,000	$34,000	$34,000	$19,000	$19,000
2021	$53,000	$53,000	$33,000	$33,000	$18,000	$18,000
2022	$53,000	$53,000	$32,000	$32,000	$17,000	$17,000
2023	$53,000	$53,000	$31,000	$31,000	$16,000	$16,000
2024	$53,000	$53,000	$30,000	$30,000	$15,000	$15,000
2025	$53,000	$53,000	$29,000	$29,000	$14,000	$14,000
Total			$834,000	$834,000	$609,000	$609,000
Annualized			$54,000	$54,000	$56,000	$56,000

Notes: Pasts impacts to the Service include monitoring, fencing and volunteer program implementation.

C.4.4 Coal Oil Point (Unit CA 18)

Past Impacts

Exhibit C-22
Past Impacts of Plover Management at Coal Oil Point (Unit CA 18)

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
1999	$12,000	$12,000	$14,000	$14,000	$18,000	$18,000
2000	$12,000	$12,000	$14,000	$14,000	$17,000	$17,000
2001	$62,000	$62,000	$70,000	$70,000	$82,000	$82,000
2002	$21,000	$21,000	$23,000	$23,000	$25,000	$25,000
2003	$33,000	$33,000	$35,000	$35,000	$38,000	$38,000
2004	$56,000	$56,000	$58,000	$58,000	$60,000	$60,000
Total			$214,000	$214,000	$240,000	$240,000

Notes: Impacts from 1999 to 2000 are due to plover monitoring and initial development of a management plan. Costs in 2001 are from plover management plan development, docent stipend, hiring of researchers, and supplies. Impacts in 2002 includes docent pay, portion manager's salary, supplies, and monitoring; the same costs were incurred in 2003 and 2004 plus increased funding for these efforts.

Future Impacts

Exhibit C-23
Future Impacts of Plover Management at Coal Oil Point (Unit CA 18)

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$28,000	$393,000	$28,000	$393,000	$28,000	$393,000
2006	$28,000	$393,000	$27,000	$382,000	$26,000	$367,000
2007	$28,000	$393,000	$26,000	$370,000	$24,000	$343,000
2008	$28,000	$393,000	$25,000	$360,000	$23,000	$321,000
2009	$28,000	$393,000	$25,000	$349,000	$21,000	$300,000
2010	$28,000	$393,000	$24,000	$339,000	$20,000	$280,000
2011	$28,000	$393,000	$23,000	$329,000	$19,000	$262,000
2012	$28,000	$393,000	$23,000	$320,000	$17,000	$245,000
2013	$28,000	$393,000	$22,000	$310,000	$16,000	$229,000
2014	$28,000	$393,000	$21,000	$301,000	$15,000	$214,000
2015	$28,000	$393,000	$21,000	$292,000	$14,000	$200,000
2016	$28,000	$393,000	$20,000	$284,000	$13,000	$187,000
2017	$28,000	$393,000	$19,000	$276,000	$12,000	$174,000
2018	$28,000	$393,000	$19,000	$268,000	$12,000	$163,000
2019	$28,000	$393,000	$18,000	$260,000	$11,000	$152,000
2020	$28,000	$393,000	$18,000	$252,000	$10,000	$142,000
2021	$28,000	$393,000	$17,000	$245,000	$9,000	$133,000
2022	$28,000	$393,000	$17,000	$238,000	$9,000	$124,000
2023	$28,000	$393,000	$16,000	$231,000	$8,000	$116,000
2024	$28,000	$393,000	$16,000	$224,000	$8,000	$109,000
2025	$28,000	$393,000	$15,000	$218,000	$7,000	$102,000
Total			$441,000	$6,240,000	$322,000	$4,556,000
Annualized			$29,000	$405,000	$30,000	$421,000

Notes: Future costs at low end are for management plan implementation, and at high end include potential costs of predator management of $1,000 per day, which is contingent upon funding.

C.5 Oregon Parks and Recreation Department (ORPD)

C.5.1 Impacts in 10 Unoccupied Areas covered by the future Oregon HCP

Future Impacts

Exhibit C-24
Future Per Effort Costs in 10 Unoccupied Potential Critical Habitat Units in Oregon (Constant Dollars)

Conservation Effort	Impact
Predator Management	$4,000 per year in each area
Monitoring	$20,000 per year in each area
Compliance Monitoring	$3,000 per year in each area
Symbolic Fencing	$5,000 in each area in first year, and $1,500 in each area in subsequent years
Beach Access Modification	$10,000 in OR 1A in year 2006

Exhibit C-25
Future Impacts of Plover Management in Unoccupied Areas in Oregon (Constant Dollars)

Year	OR 1A	OR 1B	OR 2	OR 3	OR 4	OR 5B	OR 8C	OR 10C	OR 11	OR 12	TOTAL (Constant Dollars)
2005	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2006	$42,000	$32,000	$32,000	$0	$0	$0	$0	$0	$0	$0	$106,000
2007	$29,000	$29,000	$29,000	$0	$0	$0	$0	$0	$0	$0	$86,000
2008	$29,000	$29,000	$29,000	$0	$0	$0	$0	$0	$0	$0	$86,000
2009	$29,000	$29,000	$29,000	$0	$0	$0	$0	$0	$0	$0	$86,000
2010	$29,000	$29,000	$29,000	$0	$0	$0	$0	$0	$0	$0	$86,000
2011	$29,000	$29,000	$29,000	$32,000	$0	$32,000	$0	$0	$0	$0	$150,000
2012	$29,000	$29,000	$29,000	$29,000	$0	$29,000	$0	$0	$0	$0	$143,000
2013	$29,000	$29,000	$29,000	$29,000	$0	$29,000	$0	$0	$0	$0	$143,000
2014	$29,000	$29,000	$29,000	$29,000	$0	$29,000	$0	$0	$0	$0	$143,000
2015	$29,000	$29,000	$29,000	$29,000	$0	$29,000	$0	$0	$0	$0	$143,000
2016	$29,000	$29,000	$29,000	$29,000	$0	$29,000	$32,000	$32,000	$32,000	$0	$239,000
2017	$29,000	$29,000	$29,000	$29,000	$0	$29,000	$29,000	$29,000	$29,000	$0	$228,000
2018	$29,000	$29,000	$29,000	$29,000	$0	$29,000	$29,000	$29,000	$29,000	$0	$228,000
2019	$29,000	$29,000	$29,000	$29,000	$0	$29,000	$29,000	$29,000	$29,000	$0	$228,000
2020	$29,000	$29,000	$29,000	$29,000	$0	$29,000	$29,000	$29,000	$29,000	$0	$228,000
2021	$29,000	$29,000	$29,000	$29,000	$32,000	$29,000	$29,000	$29,000	$29,000	$32,000	$292,000
2022	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$285,000
2023	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$285,000
2024	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$285,000
2025	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$285,000

Exhibit C-26
Present Value of Future Impacts of Plover Management in Unoccupied Areas in Oregon (3% Discount Rate)

Year	OR 1A	OR 1B	OR 2	OR 3	OR 4	OR 5B	OR 8C	OR 10C	OR 11	OR 12	TOTAL (3%)
2005	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2006	$41,000	$31,000	$31,000	$0	$0	$0	$0	$0	$0	$0	$103,000
2007	$27,000	$27,000	$27,000	$0	$0	$0	$0	$0	$0	$0	$81,000
2008	$26,000	$26,000	$26,000	$0	$0	$0	$0	$0	$0	$0	$78,000
2009	$25,000	$25,000	$25,000	$0	$0	$0	$0	$0	$0	$0	$76,000
2010	$25,000	$25,000	$25,000	$0	$0	$0	$0	$0	$0	$0	$74,000
2011	$24,000	$24,000	$24,000	$27,000	$0	$27,000	$0	$0	$0	$0	$125,000
2012	$23,000	$23,000	$23,000	$23,000	$0	$23,000	$0	$0	$0	$0	$116,000
2013	$22,000	$22,000	$22,000	$22,000	$0	$22,000	$0	$0	$0	$0	$112,000
2014	$22,000	$22,000	$22,000	$22,000	$0	$22,000	$0	$0	$0	$0	$109,000
2015	$21,000	$21,000	$21,000	$21,000	$0	$21,000	$0	$0	$0	$0	$106,000
2016	$21,000	$21,000	$21,000	$21,000	$0	$21,000	$23,000	$23,000	$23,000	$0	$172,000
2017	$20,000	$20,000	$20,000	$20,000	$0	$20,000	$20,000	$20,000	$20,000	$0	$160,000
2018	$19,000	$19,000	$19,000	$19,000	$0	$19,000	$19,000	$19,000	$19,000	$0	$155,000
2019	$19,000	$19,000	$19,000	$19,000	$0	$19,000	$19,000	$19,000	$19,000	$0	$151,000
2020	$18,000	$18,000	$18,000	$18,000	$0	$18,000	$18,000	$18,000	$18,000	$0	$146,000
2021	$18,000	$18,000	$18,000	$18,000	$20,000	$18,000	$18,000	$18,000	$18,000	$20,000	$182,000
2022	$17,000	$17,000	$17,000	$17,000	$17,000	$17,000	$17,000	$17,000	$17,000	$17,000	$172,000
2023	$17,000	$17,000	$17,000	$17,000	$17,000	$17,000	$17,000	$17,000	$17,000	$17,000	$167,000
2024	$16,000	$16,000	$16,000	$16,000	$16,000	$16,000	$16,000	$16,000	$16,000	$16,000	$163,000
2025	$16,000	$16,000	$16,000	$16,000	$16,000	$16,000	$16,000	$16,000	$16,000	$16,000	$158,000
Total	$437,000	$427,000	$427,000	$296,000	$86,000	$296,000	$183,000	$183,000	$183,000	$86,000	$2,607,000
Annualized	$28,000	$28,000	$28,000	$19,000	$6,000	$19,000	$12,000	$12,000	$12,000	$6,000	$169,000

Exhibit C-27
Present Value of Future Impacts of Plover Management in Unoccupied Areas in Oregon (7% Discount Rate)

Year	OR 1A	OR 1B	OR 2	OR 3	OR 4	OR 5B	OR 8C	OR 10C	OR 11	OR 12	TOTAL (7%)
2005	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2006	$39,000	$30,000	$30,000	$0	$0	$0	$0	$0	$0	$0	$99,000
2007	$25,000	$25,000	$25,000	$0	$0	$0	$0	$0	$0	$0	$75,000
2008	$23,000	$23,000	$23,000	$0	$0	$0	$0	$0	$0	$0	$70,000
2009	$22,000	$22,000	$22,000	$0	$0	$0	$0	$0	$0	$0	$65,000
2010	$20,000	$20,000	$20,000	$0	$0	$0	$0	$0	$0	$0	$61,000
2011	$19,000	$19,000	$19,000	$21,000	$0	$21,000	$0	$0	$0	$0	$100,000
2012	$18,000	$18,000	$18,000	$18,000	$0	$18,000	$0	$0	$0	$0	$89,000
2013	$17,000	$17,000	$17,000	$17,000	$0	$17,000	$0	$0	$0	$0	$83,000
2014	$16,000	$16,000	$16,000	$16,000	$0	$16,000	$0	$0	$0	$0	$78,000
2015	$14,000	$14,000	$14,000	$14,000	$0	$14,000	$0	$0	$0	$0	$72,000
2016	$14,000	$14,000	$14,000	$14,000	$0	$14,000	$15,000	$15,000	$15,000	$0	$113,000
2017	$13,000	$13,000	$13,000	$13,000	$0	$13,000	$13,000	$13,000	$13,000	$0	$101,000
2018	$12,000	$12,000	$12,000	$12,000	$0	$12,000	$12,000	$12,000	$12,000	$0	$95,000
2019	$11,000	$11,000	$11,000	$11,000	$0	$11,000	$11,000	$11,000	$11,000	$0	$88,000
2020	$10,000	$10,000	$10,000	$10,000	$0	$10,000	$10,000	$10,000	$10,000	$0	$83,000
2021	$10,000	$10,000	$10,000	$10,000	$11,000	$10,000	$10,000	$10,000	$10,000	$11,000	$99,000
2022	$9,000	$9,000	$9,000	$9,000	$9,000	$9,000	$9,000	$9,000	$9,000	$9,000	$90,000
2023	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$84,000
2024	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$79,000
2025	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$74,000
Total	$315,000	$305,000	$305,000	$187,000	$44,000	$187,000	$103,000	$103,000	$103,000	$44,000	$1,697,000
Annualized	$29,000	$28,000	$28,000	$17,000	$4,000	$17,000	$10,000	$10,000	$10,000	$4,000	$157,000

C.5.2 Oregon HCP (Statewide)

Past Impacts

Exhibit C-28
Past Impacts of OR HCP

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
1993	$52,000	$52,000	$74,000	$74,000	$117,000	$117,000
1994	$52,000	$52,000	$72,000	$72,000	$109,000	$109,000
1995	$52,000	$52,000	$70,000	$70,000	$102,000	$102,000
1996	$52,000	$52,000	$68,000	$68,000	$95,000	$95,000
1997	$68,000	$68,000	$86,000	$86,000	$117,000	$117,000
1998	$92,000	$92,000	$113,000	$113,000	$147,000	$147,000
1999	$176,000	$176,000	$210,000	$210,000	$264,000	$264,000
2000	$42,000	$42,000	$49,000	$49,000	$59,000	$59,000
2001	$166,000	$166,000	$187,000	$187,000	$218,000	$218,000
2002	$144,000	$144,000	$158,000	$158,000	$177,000	$177,000
2003	$146,000	$146,000	$155,000	$155,000	$167,000	$167,000
2004	$160,000	$160,000	$165,000	$165,000	$172,000	$172,000
Total			$1,406,000	$1,406,000	$1,744,000	$1,744,000

Notes: Pasts costs are of plover monitoring from 1993 to 2004.

Future Impacts

Exhibit C-29
Future Impacts of OR HCP

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$443,000	$443,000	$443,000	$443,000	$443,000	$443,000
2006	$130,000	$160,000	$126,000	$155,000	$121,000	$150,000
2007	$130,000	$160,000	$123,000	$151,000	$114,000	$140,000
2008	$130,000	$160,000	$119,000	$146,000	$106,000	$131,000
2009	$130,000	$160,000	$116,000	$142,000	$99,000	$122,000
2010	$130,000	$160,000	$112,000	$138,000	$93,000	$114,000
2011	$130,000	$160,000	$109,000	$134,000	$87,000	$107,000
2012	$130,000	$160,000	$106,000	$130,000	$81,000	$100,000
2013	$130,000	$160,000	$103,000	$126,000	$76,000	$93,000
2014	$130,000	$160,000	$100,000	$123,000	$71,000	$87,000
2015	$130,000	$160,000	$97,000	$119,000	$66,000	$81,000
2016	$130,000	$160,000	$94,000	$116,000	$62,000	$76,000
2017	$130,000	$160,000	$91,000	$112,000	$58,000	$71,000
2018	$130,000	$160,000	$89,000	$109,000	$54,000	$66,000
2019	$130,000	$160,000	$86,000	$106,000	$50,000	$62,000
2020	$130,000	$160,000	$83,000	$103,000	$47,000	$58,000
2021	$130,000	$160,000	$81,000	$100,000	$44,000	$54,000
2022	$130,000	$160,000	$79,000	$97,000	$41,000	$51,000
2023	$130,000	$160,000	$76,000	$94,000	$38,000	$47,000
2024	$130,000	$160,000	$74,000	$91,000	$36,000	$44,000
2025	$130,000	$160,000	$72,000	$89,000	$34,000	$41,000
Total			$2,377,000	$2,823,000	$1,820,000	$2,138,000
Annualized			$154,000	$183,000	$168,000	$197,000

Notes: Future costs are annual costs of plover monitoring and approximately $304,000 in 2005 for admininstrative costs of HCP development.

C.6 Bureau of Land Management (BLM), Coos Bay

C.6.1 Coos Bay Shorelands (Unit OR 9)

Past Impacts

Exhibit C-30
Past Impacts of Plover Management at Coos Bay Shorelands

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
1993	$0	$0	$0	$0	$0	$0
1994	$241,000	$241,000	$334,000	$334,000	$507,000	$507,000
1995	$16,000	$16,000	$22,000	$22,000	$31,000	$31,000
1996	$0	$0	$0	$0	$0	$0
1997	$0	$0	$0	$0	$0	$0
1998	$32,000	$32,000	$39,000	$39,000	$51,000	$51,000
1999	$5,000	$5,000	$6,000	$6,000	$8,000	$8,000
2000	$5,000	$5,000	$6,000	$6,000	$7,000	$7,000
2001	$5,000	$5,000	$6,000	$6,000	$7,000	$7,000
2002	$5,000	$5,000	$5,000	$5,000	$6,000	$6,000
2003	$25,000	$25,000	$27,000	$27,000	$29,000	$29,000
2004	$25,000	$25,000	$26,000	$26,000	$27,000	$27,000
Total			$470,000	$470,000	$673,000	$673,000

Notes: Past costs are of predator control ($20K per year from 2003-2004) and habitat restoration (differs by year). Monitoring costs are included in OR HCP impacts in Exhibit C-28.

Future Impacts

Exhibit C-31
Future Impacts of Plover Management at Coos Bay Shorelands

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000
2006	$25,000	$25,000	$24,000	$24,000	$23,000	$23,000
2007	$25,000	$25,000	$24,000	$24,000	$22,000	$22,000
2008	$25,000	$25,000	$23,000	$23,000	$20,000	$20,000
2009	$25,000	$25,000	$22,000	$22,000	$19,000	$19,000
2010	$25,000	$25,000	$22,000	$22,000	$18,000	$18,000
2011	$25,000	$25,000	$21,000	$21,000	$17,000	$17,000
2012	$25,000	$25,000	$20,000	$20,000	$16,000	$16,000
2013	$25,000	$25,000	$20,000	$20,000	$15,000	$15,000
2014	$25,000	$25,000	$19,000	$19,000	$14,000	$14,000
2015	$25,000	$25,000	$19,000	$19,000	$13,000	$13,000
2016	$25,000	$25,000	$18,000	$18,000	$12,000	$12,000
2017	$25,000	$25,000	$18,000	$18,000	$11,000	$11,000
2018	$25,000	$25,000	$17,000	$17,000	$10,000	$10,000
2019	$25,000	$25,000	$17,000	$17,000	$10,000	$10,000
2020	$25,000	$25,000	$16,000	$16,000	$9,000	$9,000
2021	$25,000	$25,000	$16,000	$16,000	$8,000	$8,000
2022	$25,000	$25,000	$15,000	$15,000	$8,000	$8,000
2023	$25,000	$25,000	$15,000	$15,000	$7,000	$7,000
2024	$25,000	$25,000	$14,000	$14,000	$7,000	$7,000
2025	$25,000	$25,000	$14,000	$14,000	$6,000	$6,000
Total			$397,000	$397,000	$290,000	$290,000
Annualized			$26,000	$26,000	$27,000	$27,000

Notes: Future costs are of predator control ($20K per year) and habitat restoration (expected to be $5K per year). Impacts of plover monitoring are included in the OR HCP costs in Exhibit C-29.

C.6.2 New River Area of Critical Environmental Concern (ACEC) (Unit OR 10A)

Past Impacts

Exhibit C-32
Past Impacts of Plover Management at New River ACEC

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2002	$70,000	$70,000	$76,000	$76,000	$86,000	$86,000
2003	$90,000	$90,000	$95,000	$95,000	$103,000	$103,000
2004	$110,000	$110,000	$113,000	$113,000	$118,000	$118,000
Total			$285,000	$285,000	$306,000	$306,000

Notes: Pasts costs are of habitat restoration ($70,000 in 2002-2003 and $90,000 in 2004) and predator control ($20,000 per year in 2003-2004). Impacts of monitoring efforts are included in the OR HCP costs in Exhibit C-28.

Future Impacts

Exhibit C-33
Future Impacts of Plover Management at New River ACEC

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$30,000	$32,000	$30,000	$32,000	$30,000	$32,000
2006	$30,000	$32,000	$29,000	$31,000	$28,000	$30,000
2007	$30,000	$32,000	$28,000	$30,000	$26,000	$28,000
2008	$30,000	$32,000	$27,000	$29,000	$24,000	$26,000
2009	$30,000	$32,000	$27,000	$28,000	$23,000	$24,000
2010	$30,000	$32,000	$26,000	$28,000	$21,000	$23,000
2011	$30,000	$32,000	$25,000	$27,000	$20,000	$21,000
2012	$30,000	$32,000	$24,000	$26,000	$19,000	$20,000
2013	$30,000	$32,000	$24,000	$25,000	$17,000	$19,000
2014	$30,000	$32,000	$23,000	$25,000	$16,000	$17,000
2015	$30,000	$32,000	$22,000	$24,000	$15,000	$16,000
2016	$30,000	$32,000	$22,000	$23,000	$14,000	$15,000
2017	$30,000	$32,000	$21,000	$22,000	$13,000	$14,000
2018	$30,000	$32,000	$20,000	$22,000	$12,000	$13,000
2019	$30,000	$32,000	$20,000	$21,000	$12,000	$12,000
2020	$30,000	$32,000	$19,000	$21,000	$11,000	$12,000
2021	$30,000	$32,000	$19,000	$20,000	$10,000	$11,000
2022	$30,000	$32,000	$18,000	$19,000	$9,000	$10,000
2023	$30,000	$32,000	$18,000	$19,000	$9,000	$9,000
2024	$30,000	$32,000	$17,000	$18,000	$8,000	$9,000
2025	$30,000	$32,000	$17,000	$18,000	$8,000	$8,000
Total			$476,000	$508,000	$348,000	$371,000
Annualized			$31,000	$33,000	$32,000	$34,000

Notes: Future costs are of restoration ($10,000 to $12,000 per year), and predator control ($20,000 per year). Future impacts of monitoring are included in the cost of the OR HCP in Exhibit C-29.

C.7 U.S. Forest Service

C.7.1 Siuslaw National Forest (OR 7)

Past Impacts

Exhibit C-34
Past Impacts of Plover Management at Siuslaw National Forest

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
1995	$23,000	$23,000	$31,000	$31,000	$45,000	$45,000
1996	$23,000	$23,000	$30,000	$30,000	$42,000	$42,000
1997	$23,000	$23,000	$29,000	$29,000	$40,000	$40,000
1998	$23,000	$23,000	$28,000	$28,000	$37,000	$37,000
1999	$23,000	$23,000	$27,000	$27,000	$35,000	$35,000
2000	$23,000	$23,000	$27,000	$27,000	$32,000	$32,000
2001	$23,000	$23,000	$26,000	$26,000	$30,000	$30,000
2002	$23,000	$23,000	$25,000	$25,000	$28,000	$28,000
2003	$23,000	$23,000	$24,000	$24,000	$26,000	$26,000
2004	$23,000	$23,000	$24,000	$24,000	$25,000	$25,000
Total			$272,000	$272,000	$340,000	$340,000

Notes: Past costs are of predator control ($7,000 per year from 1995-2004), fencing ($10,000 per year from 1995-2004) and restoration ($6,000 per year from 1995-2004).

Future Impacts

Exhibit C-35
Future Impacts of Plover Management at Siuslaw National Forest

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$23,000	$23,000	$23,000	$23,000	$23,000	$23,000
2006	$16,000	$16,000	$16,000	$16,000	$15,000	$15,000
2007	$23,000	$23,000	$22,000	$22,000	$20,000	$20,000
2008	$16,000	$16,000	$15,000	$15,000	$13,000	$13,000
2009	$23,000	$23,000	$20,000	$20,000	$18,000	$18,000
2010	$16,000	$16,000	$14,000	$14,000	$11,000	$11,000
2011	$23,000	$23,000	$19,000	$19,000	$15,000	$15,000
2012	$16,000	$16,000	$13,000	$13,000	$10,000	$10,000
2013	$23,000	$23,000	$18,000	$18,000	$13,000	$13,000
2014	$16,000	$16,000	$12,000	$12,000	$9,000	$9,000
2015	$23,000	$23,000	$17,000	$17,000	$12,000	$12,000
2016	$16,000	$16,000	$12,000	$12,000	$8,000	$8,000
2017	$23,000	$23,000	$16,000	$16,000	$10,000	$10,000
2018	$16,000	$16,000	$11,000	$11,000	$7,000	$7,000
2019	$23,000	$23,000	$15,000	$15,000	$9,000	$9,000
2020	$16,000	$16,000	$10,000	$10,000	$6,000	$6,000
2021	$23,000	$23,000	$14,000	$14,000	$8,000	$8,000
2022	$16,000	$16,000	$10,000	$10,000	$5,000	$5,000
2023	$23,000	$23,000	$14,000	$14,000	$7,000	$7,000
2024	$16,000	$16,000	$9,000	$9,000	$4,000	$4,000
2025	$23,000	$23,000	$13,000	$13,000	$6,000	$6,000
Total			$312,000	$312,000	$228,000	$228,000
Annualized			$20,000	$20,000	$21,000	$21,000

Notes: Future costs are of predator control ($7,000 per year every other year), fencing ($10,000 per year) and restoration ($6,000 per year).

C.7.2 Oregon Dune National Recreation Area (NRA) (Units 8A and 8D)

Past Impacts

Exhibit C-36
Past Impacts of Plover Management at Oceano Dunes NRA Per Unit (impacts apply to both Unit OR 8A and 8D)

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
1995	$23,000	$23,000	$31,000	$31,000	$45,000	$45,000
1996	$23,000	$23,000	$30,000	$30,000	$42,000	$42,000
1997	$23,000	$23,000	$29,000	$29,000	$40,000	$40,000
1998	$23,000	$23,000	$28,000	$28,000	$37,000	$37,000
1999	$23,000	$23,000	$27,000	$27,000	$35,000	$35,000
2000	$23,000	$23,000	$27,000	$27,000	$32,000	$32,000
2001	$23,000	$23,000	$26,000	$26,000	$30,000	$30,000
2002	$23,000	$23,000	$25,000	$25,000	$28,000	$28,000
2003	$23,000	$23,000	$24,000	$24,000	$26,000	$26,000
2004	$23,000	$23,000	$24,000	$24,000	$25,000	$25,000
Total			$272,000	$272,000	$340,000	$340,000

Notes: Past costs are of predator control ($7,000 per year from 1995-2004), fencing ($10,000 per year from 1995-2004) and restoration ($6,000 per year from 1995-2004 in constant dollar terms). These full impacts are due to efforts in each of Units OR 8A and 8D.

Future Impacts

Exhibit C-37
Future Impacts of Plover Management at Oceano Dunes NRA Per Unit (impacts apply to both Unit OR 8A and 8D)

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$23,000	$23,000	$23,000	$23,000	$23,000	$23,000
2006	$16,000	$16,000	$16,000	$16,000	$15,000	$15,000
2007	$23,000	$23,000	$22,000	$22,000	$20,000	$20,000
2008	$16,000	$16,000	$15,000	$15,000	$13,000	$13,000
2009	$23,000	$23,000	$20,000	$20,000	$18,000	$18,000
2010	$16,000	$16,000	$14,000	$14,000	$11,000	$11,000
2011	$23,000	$23,000	$19,000	$19,000	$15,000	$15,000
2012	$16,000	$16,000	$13,000	$13,000	$10,000	$10,000
2013	$23,000	$23,000	$18,000	$18,000	$13,000	$13,000
2014	$16,000	$16,000	$12,000	$12,000	$9,000	$9,000
2015	$23,000	$23,000	$17,000	$17,000	$12,000	$12,000
2016	$16,000	$16,000	$12,000	$12,000	$8,000	$8,000
2017	$23,000	$23,000	$16,000	$16,000	$10,000	$10,000
2018	$16,000	$16,000	$11,000	$11,000	$7,000	$7,000
2019	$23,000	$23,000	$15,000	$15,000	$9,000	$9,000
2020	$16,000	$16,000	$10,000	$10,000	$6,000	$6,000
2021	$23,000	$23,000	$14,000	$14,000	$8,000	$8,000
2022	$16,000	$16,000	$10,000	$10,000	$5,000	$5,000
2023	$23,000	$23,000	$14,000	$14,000	$7,000	$7,000
2024	$16,000	$16,000	$9,000	$9,000	$4,000	$4,000
2025	$23,000	$23,000	$13,000	$13,000	$6,000	$6,000
Total			$312,000	$312,000	$228,000	$228,000
Annualized			$20,000	$20,000	$21,000	$21,000

Notes: Future costs are of predator control ($7,000 per year every other year), fencing ($10,000 per year) and restoration ($6,000 per year). These full impacts are due to efforts in each of Units OR 8A and 8D.

C.7.3 Oregon Dune National Recreation Area (NRA) (Units 8B and 8C)

Past Impacts

Exhibit C-38
Past Impacts of Plover Management at Oceano Dunes NRA Per Unit (impacts apply to both Unit OR 8B and 8C)

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
1995	$13,000	$13,000	$17,000	$17,000	$26,000	$26,000
1996	$13,000	$13,000	$17,000	$17,000	$24,000	$24,000
1997	$13,000	$13,000	$16,000	$16,000	$22,000	$22,000
1998	$13,000	$13,000	$16,000	$16,000	$21,000	$21,000
1999	$13,000	$13,000	$16,000	$16,000	$20,000	$20,000
2000	$13,000	$13,000	$15,000	$15,000	$18,000	$18,000
2001	$13,000	$13,000	$15,000	$15,000	$17,000	$17,000
2002	$13,000	$13,000	$14,000	$14,000	$16,000	$16,000
2003	$13,000	$13,000	$14,000	$14,000	$15,000	$15,000
2004	$13,000	$13,000	$13,000	$13,000	$14,000	$14,000
Total			$154,000	$154,000	$192,000	$192,000

Notes: Past costs are of predator control ($7,000 per year from 1995-2004) and restoration ($6,000 per year from 1995-2004). These full impacts are due to efforts in each of Units OR 8B and 8C.

Future Impacts

Exhibit C-39
Future Impacts of Plover Management at Oceano Dunes NRA Per Unit (impacts apply to both Unit OR 8B and 8C)

	Constant Dollars		Present Value (3%)		Present Value (7%)	
Year	**Low**	**High**	**Low**	**High**	**Low**	**High**
2005	$13,000	$13,000	$13,000	$13,000	$13,000	$13,000
2006	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000
2007	$13,000	$13,000	$12,000	$12,000	$11,000	$11,000
2008	$6,000	$6,000	$5,000	$5,000	$5,000	$5,000
2009	$13,000	$13,000	$12,000	$12,000	$10,000	$10,000
2010	$6,000	$6,000	$5,000	$5,000	$4,000	$4,000
2011	$13,000	$13,000	$11,000	$11,000	$9,000	$9,000
2012	$6,000	$6,000	$5,000	$5,000	$4,000	$4,000
2013	$13,000	$13,000	$10,000	$10,000	$8,000	$8,000
2014	$6,000	$6,000	$5,000	$5,000	$3,000	$3,000
2015	$13,000	$13,000	$10,000	$10,000	$7,000	$7,000
2016	$6,000	$6,000	$4,000	$4,000	$3,000	$3,000
2017	$13,000	$13,000	$9,000	$9,000	$6,000	$6,000
2018	$6,000	$6,000	$4,000	$4,000	$2,000	$2,000
2019	$13,000	$13,000	$9,000	$9,000	$5,000	$5,000
2020	$6,000	$6,000	$4,000	$4,000	$2,000	$2,000
2021	$13,000	$13,000	$8,000	$8,000	$4,000	$4,000
2022	$6,000	$6,000	$4,000	$4,000	$2,000	$2,000
2023	$13,000	$13,000	$8,000	$8,000	$4,000	$4,000
2024	$6,000	$6,000	$3,000	$3,000	$2,000	$2,000
2025	$13,000	$13,000	$7,000	$7,000	$3,000	$3,000
Total			$154,000	$154,000	$112,000	$112,000
Annualized			$10,000	$10,000	$10,000	$10,000

Notes: Future costs are of predator control ($7,000 per year every other year) and restoration ($6,000 per year). These full impacts are due to efforts in each of Units OR 8B and 8C.

C.8 Administrative Costs of Section 7 Consultation

Exhibit C-40
Section 7 Consultation Administrative Cost Model

Section 7 Effort	Scenario	Service	Action Agency	Third Party	Biological Assess-ment	Total
Technical Assistance	Low	$260	$0	$600	$0	$860
	High	$680	$0	$1,500	$0	$2,180
Formal Consultation	Low	$1,000	$1,300	$1,200	$0	$3,500
	High	$3,100	$3,900	$2,900	$4,000	$13,900
Informal Consultation	Low	$3,100	$3,900	$2,900	$4,000	$13,900
	High	$6,100	$6,500	$4,100	$5,600	$22,300
Programmatic Consultation	Low	$11,500	$9,200	$0	$5,600	$26,300
	High	$16,100	$13,800	$0	$5,600	$35,500

Past Impacts

Exhibit - 41
Number of Past Section 7 Consultations Regarding the Plover

	Technical Assistance		Informal Consultation		Formal Consultations		Programmatic Consultations	
Unit	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
WA 2. Damon Pt, Oyhut	0.7	0.7	3.8	3.8	0.0	0.0	0.0	0.0
WA 3. Midway Beach	0.5	0.5	2.8	2.8	0.0	0.0	0.0	0.0
WA 4. Leadbetter Pt	1.3	1.3	6.8	6.8	0.0	0.0	0.0	0.0
OR 3. Bayocean Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 7. Sutton/Baker Beaches	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 8A. Siltcoos River Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 8B. Dunes Overlook/Tahkenitch	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 8D. Tenmile Creek Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 9. Coos Bay N Spit	1.0	1.0	0.1	0.1	5.0	5.0	0.0	0.0
OR 10A. Bandon to Floras Lake	0.6	0.6	1.1	1.1	2.0	2.0	0.0	0.0
CA 1. Lake Earl	0.4	0.4	0.0	0.0	2.0	2.0	0.0	0.0
CA 4A. Humboldt Bay, S Spit	0.4	0.4	1.0	1.0	1.0	1.0	0.0	0.0
CA 4D. Eel River Gravel Bars	0.4	1.1	0.0	3.0	1.0	1.0	1.0	2.0
CA 12C. Monterey to Moss Lnd	0.4	0.4	0.0	0.0	2.0	2.0	0.0	0.0
CA 16. Pismo Beach/Nipomo	0.4	0.4	0.0	0.0	2.0	2.0	0.0	0.0
CA 17A. Vandenberg North	1.3	1.3	0.0	0.0	7.0	7.0	0.0	0.0
CA 19A. Mandalay to Santa Clara	0.2	0.2	0.0	0.0	1.0	1.0	0.0	0.0
CA 19C. Mugu Lagoon	0.2	0.2	0.0	0.0	1.0	1.0	0.0	0.0
CA 22A. Bolsa Chica Reserve	0.2	0.2	0.0	0.0	1.0	1.0	0.0	0.0
CA 24. San Onofre St Beach	0.4	0.4	0.0	0.0	1.0	1.0	1.0	1.0
CA 25A Batiquitos West	0.1	0.1	0.0	0.0	0.3	0.3	0.0	0.0
CA 26. Los Penasquitos	0.1	0.1	0.0	0.0	0.3	0.3	0.0	0.0
CA 27A. North Island N.	0.2	0.2	0.0	0.0	1.0	1.0	0.0	0.0
CA 27B. North Island S.	0.2	0.2	1.0	1.0	0.0	0.0	0.0	0.0
CA 27C. Silver Strand	0.4	0.4	1.0	1.0	1.0	1.0	0.0	0.0
CA 27D. Delta Beach	0.2	0.2	1.0	1.0	0.0	0.0	0.0	0.0
CA 27E. Sweetwater NWR	0.6	0.6	2.0	2.0	1.0	1.0	0.0	0.0
CA 27F. Tijuana River Beach	0.1	0.1	0.0	0.0	0.3	0.3	0.0	0.0
WA 1. Copalis Spit	0.3	0.3	1.8	1.8	0.0	0.0	0.0	0.0
OR 1A. Columbia River Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 1B. Necanicum River Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 2. Nehalem River Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 4. Netarts Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 5A. Sand Lake North	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 5B. Sand Lake South	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 6. Nestucca River Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 8C. N Umpqua River Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 10B. Sixes River Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 10C. Elk River Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 11. Euchre Creek Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
OR 12. Pistol River Spit	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0

Salinas River National Wildlife Refuge	0.2	0.2	0.0	0.0	0.0	0.0	1.0	1.0
Guadalupe/Nipomo Dunes National	0.2	0.2	0.0	0.0	0.0	0.0	1.0	1.0
Total	10.9	11.6	23.0	26.0	30.0	30.0	4.0	5.0

Exhibit - 42
Costs of Past Section 7 Consultations Regarding the Plover (Constant Dollars)

	Technical Assistance		Informal Consultation		Formal Consultations		Programmatic Consultations		Total (Constant Dollars)		Present Value (3%)		Present Value (7%)	
Unit	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
WA 2. Damon Pt, Oyhut	$1,000	$2,000	$13,000	$52,000	$0	$0	$0	$0	$14,000	$54,000	$15,000	$57,000	$16,000	$62,000
WA 3. Midway Beach	$0	$1,000	$10,000	$38,000	$0	$0	$0	$0	$10,000	$39,000	$11,000	$42,000	$12,000	$45,000
WA 4. Leadbetter Pt	$1,000	$3,000	$24,000	$94,000	$0	$0	$0	$0	$25,000	$97,000	$26,000	$103,000	$28,000	$111,000
OR 3. Bayocean Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 7. Sutton/Baker Beaches	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 8A. Siltcoos River Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 8B. Dunes Overlook/Tahkenitch	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 8D. Tenmile Creek Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 9. Coos Bay N Spit	$1,000	$2,000	$0	$1,000	$70,000	$112,000	$0	$0	$71,000	$114,000	$75,000	$121,000	$81,000	$131,000
OR 10A. Bandon to Floras Lake	$1,000	$1,000	$4,000	$15,000	$28,000	$45,000	$0	$0	$32,000	$60,000	$34,000	$64,000	$37,000	$70,000
CA 1. Lake Earl	$0	$1,000	$0	$0	$28,000	$45,000	$0	$0	$28,000	$45,000	$30,000	$48,000	$32,000	$52,000
CA 4A. Humboldt Bay, S Spit	$0	$1,000	$4,000	$14,000	$14,000	$22,000	$0	$0	$18,000	$37,000	$19,000	$39,000	$20,000	$43,000
CA 4D. Eel River Gravel Bars	$0	$2,000	$0	$42,000	$14,000	$22,000	$26,000	$71,000	$41,000	$137,000	$43,000	$146,000	$47,000	$158,000
CA 12C. Monterey to Moss Lnd	$0	$1,000	$0	$0	$28,000	$45,000	$0	$0	$28,000	$45,000	$30,000	$48,000	$32,000	$52,000
CA 16. Pismo Beach/Nipomo	$0	$1,000	$0	$0	$28,000	$45,000	$0	$0	$28,000	$45,000	$30,000	$48,000	$32,000	$52,000
CA 17A. Vandenberg North	$1,000	$3,000	$0	$0	$97,000	$156,000	$0	$0	$98,000	$159,000	$105,000	$169,000	$113,000	$183,000
CA 19A. Mandalay to Santa Clara	$0	$0	$0	$0	$14,000	$22,000	$0	$0	$14,000	$23,000	$15,000	$24,000	$16,000	$26,000
CA 19C. Mugu Lagoon	$0	$0	$0	$0	$14,000	$22,000	$0	$0	$14,000	$23,000	$15,000	$24,000	$16,000	$26,000
CA 22A. Bolsa Chica Reserve	$0	$0	$0	$0	$14,000	$22,000	$0	$0	$14,000	$23,000	$15,000	$24,000	$16,000	$26,000
CA 24. San Onofre St Beach	$0	$1,000	$0	$0	$14,000	$22,000	$26,000	$36,000	$41,000	$59,000	$43,000	$62,000	$47,000	$67,000
CA 25A Batiquitos West	$0	$0	$0	$0	$5,000	$7,000	$0	$0	$5,000	$7,000	$5,000	$8,000	$5,000	$9,000
CA 26. Los Penasquitos	$0	$0	$0	$0	$5,000	$7,000	$0	$0	$5,000	$7,000	$5,000	$8,000	$5,000	$9,000
CA 27A. North Island N.	$0	$0	$0	$0	$14,000	$22,000	$0	$0	$14,000	$23,000	$15,000	$24,000	$16,000	$26,000
CA 27B. North Island S.	$0	$0	$4,000	$14,000	$0	$0	$0	$0	$4,000	$14,000	$4,000	$15,000	$4,000	$16,000
CA 27C. Silver Strand	$0	$1,000	$4,000	$14,000	$14,000	$22,000	$0	$0	$18,000	$37,000	$19,000	$39,000	$20,000	$43,000
CA 27D. Delta Beach	$0	$0	$4,000	$14,000	$0	$0	$0	$0	$4,000	$14,000	$4,000	$15,000	$4,000	$16,000
CA 27E. Sweetwater NWR	$0	$1,000	$7,000	$28,000	$14,000	$22,000	$0	$0	$21,000	$51,000	$23,000	$55,000	$25,000	$59,000
CA 27F. Tijuana River Beach	$0	$0	$0	$0	$5,000	$7,000	$0	$0	$5,000	$7,000	$5,000	$8,000	$5,000	$9,000
WA 1. Copalis Spit	$0	$1,000	$6,000	$24,000	$0	$0	$0	$0	$6,000	$25,000	$7,000	$27,000	$7,000	$29,000
OR 1A. Columbia River Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 1B. Necanicum River Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 2. Nehalem River Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 4. Netarts Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 5A. Sand Lake North	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 5B. Sand Lake South	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 6. Nestucca River Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 8C. N Umpqua River Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 10B. Sixes River Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000

OR 10C. Elk River Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 11. Euchre Creek Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
OR 12. Pistol River Spit	$0	$0	$0	$1,000	$0	$0	$0	$0	$0	$1,000	$0	$1,000	$0	$1,000
Salinas River National Wildlife Refuge	$0	$0	$0	$0	$0	$0	$26,000	$36,000	$26,000	$36,000	$28,000	$38,000	$30,000	$41,000
Guadalupe/Nipomo Dunes National	$0	$0	$0	$0	$0	$0	$26,000	$36,000	$26,000	$36,000	$28,000	$38,000	$30,000	$41,000
										Total	$650,000	$1,309,000	$704,000	$1,418,000

Notes: Because the majority (approximately 90 percent) of these consultations occurred between 2000 and 2004, this analysis assumes the costs of consultations were evenly distributed across this time frame.

Future Impacts

Exhibit C-43
Number of Estimated Future Section 7 Consultations Regarding the Plover

Unit	Technical Assistance		Informal Consultation		Formal Consultations		Programmatic Consultations		Notes
	Low	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	
CA 4D. Eel River Gravel Bars	0	0	0	0	0	0	2	8	Consultations regarding gravel mining activity. Two are expected at the low end because last consultation was 10 years from previous consultation indicating there may be as many as 10 years between consultations. Eight consulations are estimated at the high end because the gravel mining companies may consult individually as opposed to in a group in future years. Because of unknown time frame on consults, impacts are spread evenly throughout future time
CA 16. Pismo Beach/Nipomo	0	0	0	0	1	1	0	0	Formal consultation expected in 2005 regarding recreation in this unit.
CA 18. Devereaux Beach	0	0	1	1	0	0	0	0	Consultation may occur as early as 2005
CA 19C. Mugu Lagoon	0	0	0	0	1	1	0	0	Consultation with military may occur as early as 2005.
CA 24. San Onofre St Beach	0	0	0	0	1	1	0	0	Consultation with military may occur as early as 2005.
Total	**0**	**0**	**1**	**1**	**3**	**3**	**2**	**8**	

Exhibit C-44
Estimated Costs of Future Section 7 Consultation Regarding the Plover (Constant Dollars)

	CA 4D. Eel River Gravel Bars		CA 16. Pismo Beach/Nipomo		CA 18. Devereaux Beach		CA 19C. Mugu Lagoon		CA 24. San Onofre St Beach		TOTAL FUTURE (Constant Dollars)	
Year	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
2005	$3,000	$14,000	$14,000	$22,000	$4,000	$14,000	$14,000	$22,000	$14,000	$22,000	$48,000	$94,000
2006	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2007	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2008	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2009	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2010	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2011	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2012	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2013	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2014	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2015	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2016	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2017	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2018	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2019	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2020	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2021	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2022	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2023	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2024	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000
2025	$3,000	$14,000	$0	$0	$0	$0	$0	$0	$0	$0	$3,000	$14,000

Exhibit C-45
Estimated Present Value Costs of Future Section 7 Consultation Regarding the Plover (3% Discount rate)

	CA 4D. Eel River Gravel Bars		CA 16. Pismo Beach/Nipomo		CA 18. Devereaux Beach		CA 19C. Mugu Lagoon		CA 24. San Onofre St Beach		TOTAL FUTURE (3%)	
Year	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
2005	$3,000	$14,000	$14,000	$22,000	$4,000	$14,000	$14,000	$22,000	$14,000	$22,000	$48,000	$94,000
2006	$2,000	$13,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$13,000
2007	$2,000	$13,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$13,000
2008	$2,000	$12,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$12,000
2009	$2,000	$12,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$12,000
2010	$2,000	$12,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$12,000
2011	$2,000	$11,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$11,000
2012	$2,000	$11,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$11,000
2013	$2,000	$11,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$11,000
2014	$2,000	$10,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$10,000
2015	$2,000	$10,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$10,000
2016	$2,000	$10,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$10,000
2017	$2,000	$9,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$9,000
2018	$2,000	$9,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$9,000
2019	$2,000	$9,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$9,000
2020	$2,000	$9,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$9,000
2021	$2,000	$8,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$8,000
2022	$2,000	$8,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$8,000
2023	$1,000	$8,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$8,000
2024	$1,000	$8,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$8,000
2025	$1,000	$7,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$7,000
Total	$40,000	$215,000	$14,000	$22,000	$4,000	$14,000	$14,000	$22,000	$14,000	$22,000	$85,000	$296,000
Annualized	$3,000	$14,000	$1,000	$1,000	$0	$1,000	$1,000	$1,000	$1,000	$1,000	$6,000	$19,000

Exhibit C-46
Estimated Present Value Costs of Future Section 7 Consultation Regarding the Plover (7% Discount rate)

	CA 4D. Eel River Gravel Bars		CA 16. Pismo Beach/Nipomo		CA 18. Devereaux Beach		CA 19C. Mugu Lagoon		CA 24. San Onofre St Beach		TOTAL FUTURE (7%)	
Year	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
2005	$3,000	$14,000	$14,000	$22,000	$4,000	$14,000	$14,000	$22,000	$14,000	$22,000	$48,000	$94,000
2006	$2,000	$13,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$13,000
2007	$2,000	$12,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$12,000
2008	$2,000	$11,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$11,000
2009	$2,000	$10,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$10,000
2010	$2,000	$10,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$10,000
2011	$2,000	$9,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$9,000
2012	$2,000	$8,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$8,000
2013	$1,000	$8,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$8,000
2014	$1,000	$7,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$7,000
2015	$1,000	$7,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$7,000
2016	$1,000	$6,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$6,000
2017	$1,000	$6,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$6,000
2018	$1,000	$6,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$6,000
2019	$1,000	$5,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$5,000
2020	$1,000	$5,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$5,000
2021	$1,000	$5,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$5,000
2022	$1,000	$4,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$4,000
2023	$1,000	$4,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$4,000
2024	$1,000	$4,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$4,000
2025	$1,000	$3,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,000	$3,000
Total	$29,000	$157,000	$14,000	$22,000	$4,000	$14,000	$14,000	$22,000	$14,000	$22,000	$74,000	$238,000
Annualized	$3,000	$14,000	$1,000	$2,000	$0	$1,000	$1,000	$2,000	$1,000	$2,000	$7,000	$22,000

APPENDIX D:

RECREATIONAL IMPACTS BY UNIT

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APPENDIX D: IMPACTS TO RECREATION ACTIVITIES BY UNIT

POTENTIAL CRITICAL HABITAT UNITS	Past Impacts (1993-2004) Unadjusted Impacts		Past Impacts (1993-2004) Present Value 3%		Past Impacts (1993-2004) Present Value 7%		Future Impacts (2005-2025) Constant Dollars		Future Impacts (2005-2025) Present Value 3%		Future Impacts (2005-2025) Present Value 7%		Annualized (3%)		Annualized (7%)	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Units proposed																
WA 2. Damon Pt, Oyhut	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WA 3. Midway Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WA 4. Leadbetter Pt	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 3. Bayocean Spit	$0	$0	$0	$0	$0	$0	$0	$2,141,000	$0	$1,467,000	$0	$923,000	$0	$95,000	$0	$85,000
OR 7. Sutton/Baker Beaches	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8A. Siltcoos River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8D. Tenmile Creek Spit	$54,000	$133,000	$63,000	$156,000	$79,000	$196,000	$119,000	$294,000	$89,000	$221,000	$65,000	$161,000	$6,000	$14,000	$6,000	$15,000
OR 9. Coos Bay N Spit	$0	$0	$1,000	$1,000	$1,000	$1,000	$2,000	$2,000	$1,000	$1,000	$1,000	$1,000	$0	$0	$0	$0
OR 10A. Bandon to Floras Lake	$43,000	$439,000	$50,000	$502,000	$60,000	$602,000	$126,000	$1,217,000	$95,000	$917,000	$69,000	$666,000	$6,000	$59,000	$6,000	$61,000
CA 1. Lake Earl	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 2. Big Lagoon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 3A. Clam Beach/Little Riv	$13,000	$17,000	$13,000	$18,000	$15,000	$20,000	$91,000	$740,000	$68,000	$547,000	$48,000	$389,000	$4,000	$36,000	$4,000	$36,000
CA 3B. Mad River	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$36,000	$36,000	$27,000	$27,000	$19,000	$19,000	$2,000	$2,000	$2,000	$2,000
CA 4A. Humboldt Bay, S Spit	$0	$0	$0	$0	$0	$0	$2,000	$8,000	$2,000	$6,000	$1,000	$4,000	$0	$0	$0	$0
CA 4B. Eel Riv N Spit & Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4C. Eel Riv S Spit & Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4D. Eel River Gravel Bars	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 5. MacKerricher Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 6. Manchester Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 7. Dillon Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 8. Pt Reyes Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 9. Limantour Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 10. Half Moon Bay	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 11B. Scott Cr. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 11C. Wilder Cr. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 12A. Jetty Rd to Aptos	$4,709,000	$11,539,000	$5,002,000	$12,257,000	$5,411,000	$13,260,000	$37,118,000	$90,956,000	$27,470,000	$67,313,000	$19,531,000	$47,858,000	$1,782,000	$4,367,000	$1,802,000	$4,417,000
CA 12B. Elkhorn Sl Mudflat	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 12C. Monterey to Moss Lnd	$0	$162,179,000	$0	$196,165,000	$0	$254,550,000	$150,608,000	$395,848,000	$111,459,000	$292,952,000	$79,246,000	$208,284,000	$7,231,000	$19,004,000	$7,314,000	$19,222,000
CA 13. Pt Sur Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 14. San Simeon Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 15A. Villa Cr Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 15B. Atascadero Beach	$825,000	$4,749,000	$870,000	$5,009,000	$933,000	$5,369,000	$10,261,000	$59,054,000	$7,594,000	$43,704,000	$5,399,000	$31,073,000	$493,000	$2,835,000	$498,000	$2,868,000
CA 15C. Morro Bay Beach	$8,176,000	$15,848,000	$8,675,000	$16,815,000	$9,372,000	$18,165,000	$71,219,000	$138,047,000	$52,707,000	$102,163,000	$37,474,000	$72,636,000	$3,419,000	$6,628,000	$3,458,000	$6,704,000
CA 16. Pismo Beach/Nipomo	$10,495,000	$17,524,000	$11,251,000	$18,581,000	$12,327,000	$20,066,000	$85,094,000	$189,275,000	$62,975,000	$140,075,000	$44,774,000	$99,591,000	$4,085,000	$9,087,000	$4,132,000	$9,191,000
CA 17A. Vandenberg North	$203,000	$8,625,000	$220,000	$9,342,000	$244,000	$8,579,000	$1,245,000	$52,917,000	$921,000	$39,162,000	$655,000	$27,844,000	$60,000	$2,541,000	$60,000	$2,570,000
CA 17B. Vandenberg South	$203,000	$8,625,000	$220,000	$9,342,000	$244,000	$8,579,000	$1,245,000	$52,917,000	$921,000	$39,162,000	$655,000	$27,844,000	$60,000	$2,541,000	$60,000	$2,570,000
CA 18. Devereaux Beach	$189,000	$1,294,000	$206,000	$1,413,000	$232,000	$1,588,000	$1,032,000	$7,076,000	$764,000	$5,237,000	$543,000	$3,723,000	$50,000	$340,000	$50,000	$344,000
CA 19A. Mandalay to Santa Clara	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19B. Ormond Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19C. Mugu Lagoon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19D. Mugu Lagoon S.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 20. Zuma Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21A. Santa Monica Beach	$0	$0	$0	$0	$0	$0	$6,491,000	$6,491,000	$4,804,000	$4,804,000	$3,415,000	$3,415,000	$312,000	$312,000	$315,000	$315,000
CA 21B. Dockweiler N	$0	$0	$0	$0	$0	$0	$20,363,000	$20,363,000	$15,070,000	$15,070,000	$10,714,000	$10,714,000	$978,000	$978,000	$989,000	$989,000
CA 21C. Dockweiler S	$0	$0	$0	$0	$0	$0	$20,363,000	$20,363,000	$15,070,000	$15,070,000	$10,714,000	$10,714,000	$978,000	$978,000	$989,000	$989,000
CA 21D. Hermosa Beach	$0	$0	$0	$0	$0	$0	$41,793,000	$41,793,000	$30,929,000	$30,929,000	$21,990,000	$21,990,000	$2,006,000	$2,006,000	$2,029,000	$2,029,000
CA 22A. Bolsa Chica Reserve	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 22B. Huntington St. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 23. Santa Ana River Mouth	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 24. San Onofre St Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25A Batiquitos West	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25B. Batiquitos Middle	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25C. Batiquitos East	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

POTENTIAL CRITICAL HABITAT UNITS	Past Impacts (1993-2004) Unadjusted Impacts		Past Impacts (1993-2004) Present Value 3%		Past Impacts (1993-2004) Present Value 7%		Future Impacts (2005-2025) Constant Dollars		Future Impacts (2005-2025) Present Value 3%		Future Impacts (2005-2025) Present Value 7%		Annualized (3%)		Annualized (7%)	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
CA 26. Los Penasquitos	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27A. North Island N.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27B. North Island S.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27C. Silver Strand	$2,425,000	$11,532,000	$2,581,000	$12,275,000	$2,800,000	$13,314,000	$17,264,000	$82,100,000	$12,777,000	$60,759,000	$9,084,000	$43,199,000	$829,000	$3,942,000	$838,000	$3,987,000
CA 27D. Delta Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27E. Sweetwater NWR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27F. Tijuana River Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ALL OREGON (HCP)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	*$27,338,000*	*$242,507,000*	*$29,155,000*	*$281,879,000*	*$31,721,000*	*$344,292,000*	*$464,472,000*	*$1,161,638,000*	*$343,743,000*	*$859,586,000*	*$244,397,000*	*$611,048,000*	*$22,301,000*	*$55,765,000*	*$22,552,000*	*$56,394,000*
Areas identified for possible inclusion																
WA 1. Copalis Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 1A. Columbia River Spit	$0	$0	$0	$0	$0	$0	$8,000	$909,000	$6,000	$674,000	$4,000	$478,000	$0	$44,000	$0	$44,000
OR 1B. Necanicum River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 2. Nehalem River Spit	$0	$0	$0	$0	$0	$0	$578,000	$2,312,000	$429,000	$1,714,000	$304,000	$1,215,000	$28,000	$111,000	$28,000	$112,000
OR 4. Netarts Spit	$0	$0	$0	$0	$0	$0	$0	$303,000	$0	$178,000	$0	$90,000	$0	$12,000	$0	$8,000
OR 5A. Sand Lake North	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 5B. Sand Lake South	$0	$0	$0	$0	$0	$0	$376,000	$775,000	$258,000	$531,000	$162,000	$334,000	$17,000	$34,000	$15,000	$31,000
OR 6. Nestucca River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8C. N Umpqua River Spit	$0	$0	$0	$0	$0	$0	$86,000	$90,000	$54,000	$57,000	$30,000	$32,000	$4,000	$4,000	$3,000	$3,000
OR 10B. Sixes River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 10C. Elk River Spit	$0	$0	$0	$0	$0	$0	$5,000	$76,000	$3,000	$48,000	$2,000	$27,000	$0	$3,000	$0	$3,000
OR 11. Euchre Creek Spit	$0	$0	$0	$0	$0	$0	$0	$17,000	$0	$11,000	$0	$6,000	$0	$1,000	$0	$1,000
OR 12. Pistol River Spit	$0	$0	$0	$0	$0	$0	$0	$28,000	$0	$16,000	$0	$8,000	$0	$1,000	$0	$1,000
CA 11A. Waddell Cr Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$1,053,000*	*$4,510,000*	*$750,000*	*$3,229,000*	*$502,000*	*$2,190,000*	*$49,000*	*$210,000*	*$46,000*	*$203,000*
Areas proposed for exclusion																
Salinas River National Wildlife Refuge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Guadalupe/Nipomo Dunes National Wildlife Refuge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
San Diego	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Marine Corps Base Camp Pendleton	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Naval Amphibious Base	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
San Francisco Bay	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*

APPENDIX E:

DEVELOPMENT IMPACTS BY UNIT

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APPENDIX E: IMPACTS TO DEVELOPMENT ACTIVITIES BY UNIT

POTENTIAL CRITICAL HABITAT UNITS	Past Impacts (1993-2004)		Past Impacts (1993-2004) Present Value 3%		Past Impacts (1993-2004)		Future Impacts (2005-2025)		Future Impacts (2005-2025)		Future Impacts (2005-2025)		Annualized (3%)		Annualized (7%)	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Units proposed																
WA 2. Damon Pt, Oyhut	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WA 3. Midway Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WA 4. Leadbetter Pt	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 3. Bayocean Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 7. Sutton/Baker Beaches	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8A. Siltcoos River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8D. Tenmile Creek Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 9. Coos Bay N Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 10A. Bandon to Floras Lake	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 1. Lake Earl	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 2. Big Lagoon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 3A. Clam Beach/Little Riv	$0	$0	$0	$0	$0	$0	$630,000	$630,000	$476,000	$476,000	$348,000	$348,000	$31,000	$31,000	$32,000	$32,000
CA 3B. Mad River	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4A. Humboldt Bay, S Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4B. Eel Riv N Spit & Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4C. Eel Riv S Spit & Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4D. Eel River Gravel Bars	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 5. MacKerricher Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 6. Manchester Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 7. Dillon Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 8. Pt Reyes Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 9. Limantour Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 10. Half Moon Bay	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 11B. Scott Cr. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 11C. Wilder Cr. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 12A. Jetty Rd to Aptos	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 12B. Elkhorn Sl Mudflat	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 12C. Monterey to Moss Lnd	########	$4,400,000	$3,819,000	$4,425,000	########	$4,460,000	$1,050,000	$2,100,000	$794,000	$1,588,000	$580,000	$1,159,000	$52,000	$103,000	$54,000	$107,000
CA 13. Pt Sur Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 14. San Simeon Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 15A. Villa Cr Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 15B. Atascadero Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 15C. Morro Bay Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 16. Pismo Beach/Nipomo	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 17A. Vandenberg North	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 17B. Vandenberg South	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 18. Devereaux Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

POTENTIAL CRITICAL HABITAT UNITS	**Past Impacts (1993-2004)**		**Past Impacts (1993-2004) Present Value 3%**		**Past Impacts (1993-2004)**		**Future Impacts (2005-2025)**		**Future Impacts (2005-2025)**		**Future Impacts (2005-2025)**		**Annualized (3%)**		**Annualized (7%)**	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
CA 19A. Mandalay to Santa Clara	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19B. Ormond Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19C. Mugu Lagoon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19D. Mugu Lagoon S.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 20. Zuma Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21A. Santa Monica Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21B. Dockweiler N	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21C. Dockweiler S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21D. Hermosa Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 22A. Bolsa Chica Reserve	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 22B. Huntington St. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 23. Santa Ana River Mouth	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 24. San Onofre St Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25A Batiquitos West	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25B. Batiquitos Middle	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25C. Batiquitos East	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 26. Los Penasquitos	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27A. North Island N.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27B. North Island S.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27C. Silver Strand	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27D. Delta Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27E. Sweetwater NWR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27F. Tijuana River Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ALL OREGON (HCP)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	*########*	*$4,400,000*	*$3,819,000*	*$4,425,000*	*#######*	*$4,460,000*	*$1,680,000*	*$2,730,000*	*$1,270,000*	*$2,064,000*	*$928,000*	*$1,507,000*	*$82,000*	*$134,000*	*$86,000*	*$139,000*
Areas identified for possible inclusion																
WA 1. Copalis Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 1A. Columbia River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 1B. Necanicum River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 2. Nehalem River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 4. Netarts Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 5A. Sand Lake North	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 5B. Sand Lake South	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 6. Nestucca River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8C. N Umpqua River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 10B. Sixes River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 10C. Elk River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 11. Euchre Creek Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 12. Pistol River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 11A. Waddell Cr Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

POTENTIAL CRITICAL HABITAT UNITS	**Past Impacts (1993-2004)**		**Past Impacts (1993-2004) Present Value 3%**		**Past Impacts (1993-2004)**		**Future Impacts (2005-2025)**		**Future Impacts (2005-2025)**		**Future Impacts (2005-2025)**		**Annualized (3%)**		**Annualized (7%)**	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
SUBTOTAL	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
Areas proposed for exclusion																
Salinas River National Wildlife Refuge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Guadalupe/Nipomo Dunes National Wildlife Refuge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
San Diego	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Marine Corps Base Camp Pendleton	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Naval Amphibious Base	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
San Francisco Bay	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*

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APPENDIX F:

IMPACTS TO MILITARY LANDS BY UNIT

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APPENDIX F: IMPACTS TO MILITARY ACTIVITIES BY UNIT

POTENTIAL CRITICAL HABITAT UNITS	Past Impacts (1993-2004) Unadjusted Impacts		Past Impacts (1993-2004) Present Value 3%		Past Impacts (1993-2004) Present Value 7%		Future Impacts (2005-2025) Constant Dollars		Future Impacts (2005-2025) Present Value 3%		Future Impacts (2005-2025) Present Value 7%		Annualized (3%)		Annualized (7%)	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Units proposed																
WA 2. Damon Pt, Oyhut	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WA 3. Midway Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WA 4. Leadbetter Pt	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 3. Bayocean Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 7. Sutton/Baker Beaches	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8A. Siltcoos River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8D. Tenmile Creek Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 9. Coos Bay N Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 10A. Bandon to Floras Lake	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 1. Lake Earl	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 2. Big Lagoon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 3A. Clam Beach/Little Riv	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 3B. Mad River	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4A. Humboldt Bay, S Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4B. Eel Riv N Spit & Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4C. Eel Riv S Spit & Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4D. Eel River Gravel Bars	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 5. MacKerricher Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 6. Manchester Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 7. Dillon Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 8. Pt Reyes Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 9. Limantour Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 10. Half Moon Bay	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 11B. Scott Cr. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 11C. Wilder Cr. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 12A. Jetty Rd to Aptos	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 12B. Elkhorn Sl Mudflat	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 12C. Monterey to Moss Lnd	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 13. Pt Sur Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 14. San Simeon Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 15A. Villa Cr Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 15B. Atascadero Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 15C. Morro Bay Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 16. Pismo Beach/Nipomo	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 17A. Vandenberg North	$2,694,000	$2,694,000	$3,038,000	$3,038,000	$3,584,000	$3,584,000	$9,123,000	$9,123,000	$6,898,000	$6,898,000	$5,037,000	$5,037,000	$447,000	$447,000	$465,000	$465,000
CA 17B. Vandenberg South	$1,308,000	$1,308,000	$1,475,000	$1,475,000	$1,741,000	$1,741,000	$4,430,000	$4,430,000	$3,350,000	$3,350,000	$2,446,000	$2,446,000	$217,000	$217,000	$226,000	$226,000
CA 18. Devereaux Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19A. Mandalay to Santa Clara	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19B. Ormond Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19C. Mugu Lagoon	$215,000	$260,000	$242,000	$291,000	$283,000	$338,000	$313,000	$317,000	$244,000	$248,000	$186,000	$190,000	$16,000	$16,000	$17,000	$18,000
CA 19D. Mugu Lagoon S.	$46,000	$56,000	$52,000	$62,000	$61,000	$72,000	$67,000	$68,000	$52,000	$53,000	$40,000	$41,000	$3,000	$3,000	$4,000	$4,000
CA 20. Zuma Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21A. Santa Monica Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21B. Dockweiler N	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21C. Dockweiler S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21D. Hermosa Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 22A. Bolsa Chica Reserve	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 22B. Huntington St. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 23. Santa Ana River Mouth	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 24. San Onofre St Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25A Batiquitos West	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25B. Batiquitos Middle	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25C. Batiquitos East	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 26. Los Penasquitos	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27A. North Island N.	$452,000	$452,000	$546,000	$546,000	$708,000	$708,000	$864,000	$864,000	$654,000	$654,000	$477,000	$477,000	$42,000	$42,000	$44,000	$44,000
CA 27B. North Island S.	$264,000	$264,000	$319,000	$319,000	$414,000	$414,000	$505,000	$505,000	$382,000	$382,000	$279,000	$279,000	$25,000	$25,000	$26,000	$26,000

POTENTIAL CRITICAL HABITAT UNITS	Past Impacts (1993-2004) Unadjusted Impacts		Past Impacts (1993-2004) Present Value 3%		Past Impacts (1993-2004) Present Value 7%		Future Impacts (2005-2025) Constant Dollars		Future Impacts (2005-2025) Present Value 3%		Future Impacts (2005-2025) Present Value 7%		Annualized (3%)		Annualized (7%)	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
CA 27C. Silver Strand	$291,000	$291,000	$351,000	$351,000	$455,000	$455,000	$556,000	$556,000	$420,000	$420,000	$307,000	$307,000	$27,000	$27,000	$28,000	$28,000
CA 27D. Delta Beach	$329,000	$329,000	$398,000	$398,000	$515,000	$515,000	$630,000	$630,000	$476,000	$476,000	$348,000	$348,000	$31,000	$31,000	$32,000	$32,000
CA 27E. Sweetwater NWR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27F. Tijuana River Beach	$5,000	$5,000	$7,000	$7,000	$8,000	$8,000	$10,000	$10,000	$8,000	$8,000	$6,000	$6,000	$1,000	$1,000	$1,000	$1,000
ALL OREGON (HCP)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	*$5,605,000*	*$5,660,000*	*$6,427,000*	*$6,487,000*	*$7,768,000*	*$7,836,000*	*$16,499,000*	*$16,504,000*	*$12,483,000*	*$12,488,000*	*$9,125,000*	*$9,130,000*	*$810,000*	*$810,000*	*$842,000*	*$843,000*
Areas identified for possible inclusion																
WA 1. Copalis Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 1A. Columbia River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 1B. Necanicum River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 2. Nehalem River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 4. Netarts Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 5A. Sand Lake North	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 5B. Sand Lake South	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 6. Nestucca River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8C. N Umpqua River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 10B. Sixes River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 10C. Elk River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 11. Euchre Creek Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 12. Pistol River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 11A. Waddell Cr Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
Areas proposed for exclusion																
Salinas River National Wildlife Refuge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Guadalupe/Nipomo Dunes National Wildlife Refuge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
San Diego	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Marine Corps Base Camp Pendleton	$944,000	$944,000	$1,111,000	$1,111,000	$1,396,000	$1,396,000	$2,488,000	$2,488,000	$2,013,000	$2,013,000	$1,374,000	$1,374,000	$131,000	$131,000	$127,000	$127,000
Naval Amphibious Base	$558,000	$558,000	$674,000	$674,000	$873,000	$873,000	$1,067,000	$1,067,000	$806,000	$806,000	$589,000	$589,000	$52,000	$52,000	$54,000	$54,000
San Francisco Bay	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	*$1,502,000*	*$1,502,000*	*$1,785,000*	*$1,785,000*	*$2,269,000*	*$2,269,000*	*$3,555,000*	*$3,555,000*	*$2,820,000*	*$2,820,000*	*$1,963,000*	*$1,963,000*	*$183,000*	*$183,000*	*$181,000*	*$181,000*

APPENDIX G:

MINING IMPACTS BY UNIT

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APPENDIX G: IMPACTS TO MINING ACTIVITIES BY UNIT

POTENTIAL CRITICAL HABITAT UNITS	Past Impacts (1993-2004) Unadjusted Impacts		Past Impacts (1993-2004) Present Value 3%		Past Impacts (1993-2004) Present Value 7%		Future Impacts (2005-2025) Constant Dollars		Future Impacts (2005-2025) Present Value 3%		Future Impacts (2005-2025) Present Value 7%		Annualized (3%)		Annualized (7%)	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Units proposed																
WA 2. Damon Pt, Oyhut	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WA 3. Midway Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WA 4. Leadbetter Pt	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 3. Bayocean Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 7. Sutton/Baker Beaches	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8A. Siltcoos River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8D. Tenmile Creek Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 9. Coos Bay N Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 10A. Bandon to Floras Lake	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 1. Lake Earl	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 2. Big Lagoon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 3A. Clam Beach/Little Riv	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 3B. Mad River	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4A. Humboldt Bay, S Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4B. Eel Riv N Spit & Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4C. Eel Riv S Spit & Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 4D. Eel River Gravel Bars	$45,000	$450,000	$52,000	$523,000	$64,000	$641,000	$105,000	$1,050,000	$79,000	$794,000	$58,000	$580,000	$5,000	$52,000	$5,000	$54,000
CA 5. MacKerricher Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 6. Manchester Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 7. Dillon Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 8. Pt Reyes Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 9. Limantour Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 10. Half Moon Bay	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 11B. Scott Cr. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 11C. Wilder Cr. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 12A. Jetty Rd to Aptos	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 12B. Elkhorn Sl Mudflat	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 12C. Monterey to Moss Lnd	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 13. Pt Sur Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 14. San Simeon Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 15A. Villa Cr Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 15B. Atascadero Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 15C. Morro Bay Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 16. Pismo Beach/Nipomo	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 17A. Vandenberg North	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 17B. Vandenberg South	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 18. Devereaux Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19A. Mandalay to Santa Clara	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19B. Ormond Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19C. Mugu Lagoon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 19D. Mugu Lagoon S.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 20. Zuma Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21A. Santa Monica Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21B. Dockweiler N	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21C. Dockweiler S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 21D. Hermosa Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 22A. Bolsa Chica Reserve	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 22B. Huntington St. Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 23. Santa Ana River Mouth	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 24. San Onofre St Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25A Batiquitos West	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25B. Batiquitos Middle	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 25C. Batiquitos East	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 26. Los Penasquitos	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

POTENTIAL CRITICAL HABITAT UNITS	Past Impacts (1993-2004) Unadjusted Impacts		Past Impacts (1993-2004) Present Value 3%		Past Impacts (1993-2004) Present Value 7%		Future Impacts (2005-2025) Constant Dollars		Future Impacts (2005-2025) Present Value 3%		Future Impacts (2005-2025) Present Value 7%		Annualized (3%)		Annualized (7%)	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
CA 27A. North Island N.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27B. North Island S.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27C. Silver Strand	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27D. Delta Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27E. Sweetwater NWR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 27F. Tijuana River Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
ALL OREGON (HCP)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	*$45,000*	*$450,000*	*$52,000*	*$523,000*	*$64,000*	*$641,000*	*$105,000*	*$1,050,000*	*$79,000*	*$794,000*	*$58,000*	*$580,000*	*$5,000*	*$52,000*	*$5,000*	*$54,000*
Areas identified for possible inclusion																
WA 1. Copalis Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 1A. Columbia River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 1B. Necanicum River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 2. Nehalem River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 4. Netarts Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 5A. Sand Lake North	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 5B. Sand Lake South	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 6. Nestucca River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 8C. N Umpqua River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 10B. Sixes River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 10C. Elk River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 11. Euchre Creek Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OR 12. Pistol River Spit	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
CA 11A. Waddell Cr Beach	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
Areas proposed for exclusion																
Salinas River National Wildlife Refuge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Guadalupe/Nipomo Dunes National Wildlife Refuge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
San Diego	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Marine Corps Base Camp Pendleton	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Naval Amphibious Base	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
San Francisco Bay	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*

APPENDIX H:

COMPARISON OF UNIT RANKINGS

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Appendix H
COMPARISON OF UNIT RANKINGS USING HIGH AND LOW PRESENT VALUE ESTIMATES
(seven percent discount rate)

High Present Value Estimate		Low Present Value Estimate	
CA 12C. Monterey to Moss Lnd	$210,378,000	CA 12C. Monterey to Moss Lnd	$80,760,000
CA 16. Pismo Beach/Nipomo	$109,309,000	CA 16. Pismo Beach/Nipomo	$54,484,000
CA 15C. Morro Bay Beach	$73,584,000	CA 15C. Morro Bay Beach	$38,421,000
CA 12A. Jetty Rd to Aptos	$48,563,000	CA 21D. Hermosa Beach	$21,990,000
CA 27C. Silver Strand	$43,714,000	CA 12A. Jetty Rd to Aptos	$20,235,000
CA 17A. Vandenberg North	$32,880,000	CA 21B. Dockweiler N	$10,714,000
CA 15B. Atascadero Beach	$31,395,000	CA 21C. Dockweiler S	$10,714,000
CA 17B. Vandenberg South	$30,290,000	CA 27C. Silver Strand	$9,599,000
CA 21D. Hermosa Beach	$21,990,000	CA 15B. Atascadero Beach	$5,721,000
CA 21B. Dockweiler N	$10,714,000	CA 17A. Vandenberg North	$5,692,000
CA 21C. Dockweiler S	$10,714,000	CA 21A. Santa Monica Beach	$3,415,000
CA 18. Devereaux Beach	$8,294,000	CA 17B. Vandenberg South	$3,101,000
CA 21A. Santa Monica Beach	$3,415,000	CA 18. Devereaux Beach	$869,000
OR 3. Bayocean Spit	$1,111,000	CA 27F. Tijuana River Beach	$519,000
OR 10A. Bandon to Floras Lake	$1,037,000	CA 4A. Humboldt Bay, S Spit	$494,000
CA 3A. Clam Beach/Little Riv	$824,000	CA 3A. Clam Beach/Little Riv	$483,000
CA 4D. Eel River Gravel Bars	$736,000	CA 27A. North Island N.	$477,000
CA 27F. Tijuana River Beach	$519,000	OR 10A. Bandon to Floras Lake	$417,000
CA 4A. Humboldt Bay, S Spit	$497,000	CA 15A. Villa Cr Beach	$383,000
CA 27A. North Island N.	$477,000	CA 27D. Delta Beach	$348,000
OR 8D. Tenmile Creek Spit	$389,000	OR 8D. Tenmile Creek Spit	$293,000
CA 15A. Villa Cr Beach	$383,000	OR 9. Coos Bay N Spit	$291,000
CA 27D. Delta Beach	$348,000	CA 27B. North Island S.	$279,000
OR 9. Coos Bay N Spit	$291,000	OR 7. Sutton/Baker Beaches	$228,000
CA 27B. North Island S.	$279,000	OR 8A. Siltcoos River Spit	$228,000
OR 7. Sutton/Baker Beaches	$228,000	CA 19C. Mugu Lagoon	$200,000
OR 8A. Siltcoos River Spit	$228,000	OR 3. Bayocean Spit	$187,000
CA 19C. Mugu Lagoon	$212,000	OR 8B. Dunes Overlook/Tahkenitch Creek Spit	$112,000
OR 8B. Dunes Overlook/Tahkenitch Creek Spit	$112,000	CA 4D. Eel River Gravel Bars	$87,000
CA 4B. Eel Riv N Spit & Beach	$87,000	CA 4B. Eel Riv N Spit & Beach	$87,000
CA 19D. Mugu Lagoon S.	$41,000	CA 19D. Mugu Lagoon S.	$40,000
CA 10. Half Moon Bay	$35,000	CA 10. Half Moon Bay	$35,000
CA 11C. Wilder Cr. Beach	$35,000	CA 11C. Wilder Cr. Beach	$35,000
CA 24. San Onofre St Beach	$22,000	CA 3B. Mad River	$19,000
CA 3B. Mad River	$19,000	CA 19A. Mandalay to Santa Clara	$17,000
CA 19A. Mandalay to Santa Clara	$17,000	CA 24. San Onofre St Beach	$14,000
CA 14. San Simeon Beach	$9,000	CA 14. San Simeon Beach	$9,000
WA 2. Damon Pt, Oyhut	$0	WA 2. Damon Pt, Oyhut	$0
WA 3. Midway Beach	$0	WA 3. Midway Beach	$0
WA 4. Leadbetter Pt	$0	WA 4. Leadbetter Pt	$0
CA 1. Lake Earl	$0	CA 1. Lake Earl	$0
CA 2. Big Lagoon	$0	CA 2. Big Lagoon	$0
CA 4C. Eel Riv S Spit & Beach	$0	CA 4C. Eel Riv S Spit & Beach	$0
CA 5. MacKerricher Beach	$0	CA 5. MacKerricher Beach	$0
CA 6. Manchester Beach	$0	CA 6. Manchester Beach	$0
CA 7. Dillon Beach	$0	CA 7. Dillon Beach	$0
CA 8. Pt Reyes Beach	$0	CA 8. Pt Reyes Beach	$0
CA 9. Limantour Spit	$0	CA 9. Limantour Spit	$0
CA 11B. Scott Cr. Beach	$0	CA 11B. Scott Cr. Beach	$0
CA 12B. Elkhorn Sl Mudflat	$0	CA 12B. Elkhorn Sl Mudflat	$0
CA 13. Pt Sur Beach	$0	CA 13. Pt Sur Beach	$0
CA 19B. Ormond Beach	$0	CA 19B. Ormond Beach	$0
CA 20. Zuma Beach	$0	CA 20. Zuma Beach	$0
CA 22A. Bolsa Chica Reserve	$0	CA 22A. Bolsa Chica Reserve	$0
CA 22B. Huntington St. Beach	$0	CA 22B. Huntington St. Beach	$0
CA 23. Santa Ana River Mouth	$0	CA 23. Santa Ana River Mouth	$0
CA 25A Batiquitos West	$0	CA 25A Batiquitos West	$0
CA 25B. Batiquitos Middle	$0	CA 25B. Batiquitos Middle	$0
CA 25C. Batiquitos East	$0	CA 25C. Batiquitos East	$0
CA 26. Los Penasquitos	$0	CA 26. Los Penasquitos	$0
CA 27E. Sweetwater NWR	$0	CA 27E. Sweetwater NWR	$0

Note: Non-site specific costs associated with the Oregon Habitat Conservation Plan (HCP) are not included in these rankings.

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