



ECONOMIC ANALYSIS OF CRITICAL
HABITAT DESIGNATION FOR
LA GRACIOSA THISTLE

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ACRONYMS AND ABBREVIATIONS

| | |
|---------|---|
| Act | Endangered Species Act |
| APA | Administrative Procedure Act |
| C.F.R. | Code of Federal Regulations |
| CAO | Cleanup or Abatement Order |
| CCC | California Coastal Commission |
| CCP | Comprehensive Conservation Plan |
| CDFG | California Department of Fish and Game |
| CDPR | California Department of Parks and Recreation |
| CEQA | California Environmental Quality Act |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| DEC | California Department of Environmental Conservation |
| DOD | Department of Defense |
| DOGGR | California Division of Oil, Gas, and Geothermal Resources |
| DOI | Department of Interior |
| E.O. | Executive Order |
| EIR | Environmental Impact Report |
| EPA | U.S. Environmental Protection Agency |
| EPS | Economic and Planning Systems |
| ESMP | Endangered Species Management Plan |
| FR | Federal Register |
| FWO | Fish and Wildlife Office |
| GIS | Geographic Information Systems |
| HCP | Habitat Conservation Plan |
| IEc | Industrial Economics, Incorporated |
| IMPLAN | Impact Analysis for Planning |
| INRMP | Integrated Resources Management Plan |
| LCP | Local Coastal Program |
| NEPA | National Environmental Policy Act |
| NRCS | Natural Resources Conservation Service |
| NWR | National Wildlife Refuge |
| OCP | Orcutt Community Plan |
| ODSVRA | Oceano Dunes State Vehicular Recreation Area |
| OHV | Off-highway vehicle |
| OHMVR | Off-highway motor vehicle recreation |
| OMB | U.S. Office of Management and Budget |
| PBA | Programmatic Biological Assessment |
| PCEs | Primary constituent elements |
| RFA | Regulatory Flexibility Act |
| RWQCB | Regional Water Quality Control Board |
| SBREFA | Small Business Regulatory Enforcement Fairness Act |
| Service | U.S. Fish and Wildlife Service |

| | |
|----------|---|
| thistle | La Graciosa thistle (<i>Cirsium loncholepsis</i>) |
| U.S. EPA | U.S. Environmental Protection Agency |
| U.S.C. | U.S. Code |
| USACE | U.S. Army Corps of Engineers |
| U.S. FWS | U.S. Fish and Wildlife Service |

EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts associated with the proposed critical habitat designation for La Graciosa thistle (*Cirsium loncholepsis*) in Santa Barbara and San Luis Obispo Counties, California, (hereafter, "thistle"). This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service (Service).

OVERVIEW OF THE PROPOSED RULE

2. The thistle was listed as endangered under the Endangered Species Act (Act) on March 20, 2000.¹ Subsequently, the Service designated critical habitat in San Luis Obispo and Santa Barbara Counties, California on March 17, 2004.² Then, on March 30, 2005, the Homebuilders Association of Northern California et al. filed a complaint against the Service, alleging that the final rule designating critical habitat violated the Act, the Administrative Procedure Act (APA), and the National Environmental Policy Act (NEPA). In March 2006, a settlement was reached to re-evaluate the 2004 critical habitat designation. Most recently, on August 6, 2008, the Service published a Proposed Rule revising the designation of critical habitat for the thistle.³ This economic analysis evaluates the likely economic impacts of the August 6, 2008 proposed rule. A map of the proposed critical habitat is presented in Exhibit ES-1.
3. Landownership in the currently proposed critical habitat units is split almost evenly between public and private entities; 52 percent of the land is owned or managed by Federal, State, or local entities, with the remaining 48 percent in private ownership.⁴ However, ownership type is not evenly distributed across the units. Landownership in Unit 1 is split evenly between private and public entities and includes several public parks: Guadalupe-Nipomo National Wildlife Refuge (NWR); Oceano Dunes State Vehicle Recreation Area (ODSVRA); and Rancho Guadalupe Dunes County Park. Units 4, 5, and 6 are primarily managed by the U.S. Department of Defense (DOD) under the auspices of Vandenberg Air Force Base. Unit 2 is 94 percent privately owned, while Unit 3 consists entirely of private land. Of the six units proposed, only Units 1 and 2 are currently considered occupied by the thistle.⁵

¹ 2000 Final Rule, 65 FR 14888.

² 2004 Final Rule, 69 FR 12553.

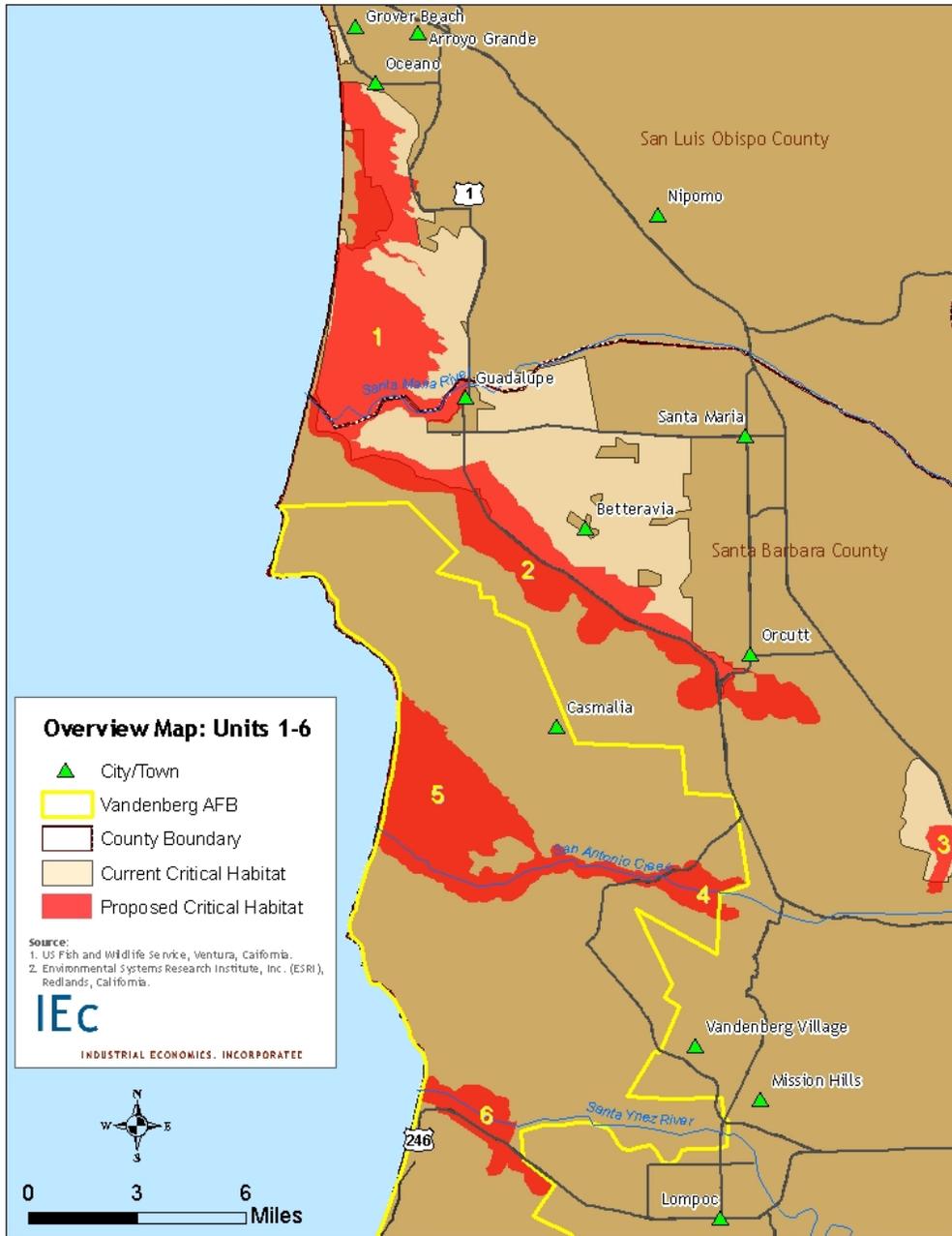
³ 2008 Proposed Rule, 73 FR 45806.

⁴ 2008 Proposed Rule, 73 FR 45818.

⁵ 2008 Proposed Rule, 73 FR 45819.

4. This analysis considers economic impacts of thistle conservation associated with the following entities or activities: 1) Vandenberg Air Force Base, 2) recreation, 3) residential and commercial development, 4) agriculture and ranching, 5) oil and gas operations, and 6) public lands management. The analysis estimates economic impacts to these entities or activities from 2000 (year of the species' final listing) to 2028 (20 years from the expected critical habitat designation). Estimated impacts are expressed as occurring pre-designation (2000 - 2008) or post-designation (2009-2028). "Pre-designation" and "post-designation" in this report refer to the revised final critical habitat designation expected in 2009. Forecast post-designation impacts are organized into two categories according to "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections already accorded the thistle; for example, under the Federal and State listing and other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts expected to result from the designation of critical habitat for the species. That is, the reported incremental conservation efforts and associated economic impacts are those expected to occur specifically because of the designation of critical habitat for the thistle.
5. Key findings of this analysis are presented below. Potential post-designation impacts are summarized in Exhibit ES-2. Potential post-designation baseline and incremental impacts are presented by unit in Exhibits ES-3 and ES-4, respectively. Exhibit ES-5 ranks the units by potential incremental impacts.

EXHIBIT ES-1 MAP OF THE PROPOSED CRITICAL HABITAT FOR LA GRACIOSA THISTLE



KEY FINDINGS

Baseline Impacts: Potential baseline impacts are estimated to be \$11.0 million to \$320 million (approximately \$20.9 million annualized), assuming a three percent discount rate, or \$10.4 million to \$230 million (approximately \$20.3 million annualized), assuming a seven percent discount rate, over the next 20 years.

Detailed Baseline Impacts: In the upper-bound scenario, impacts to recreation represent between 96 to 97 percent of total impacts, depending on the discount rate, followed by impacts to development, which account for three to four percent of the total; impacts to all other activities represent less than one percent of the total.

- **Recreation:** The potential baseline cost of recreation-related conservation activities in Unit 1 range from \$0.014 million to \$220 million, assuming a seven percent discount rate. *This range is due to uncertainty regarding impacts to off-highway vehicle (OHV) use; the lower bound assumes no impacts to OHV ridership, while the upper-bound value reflects complete closure of La Grande Tract. The differences are discussed in more detail below.*
- **Development:** The potential baseline cost of delaying residential and commercial development activities while these projects undergo section 7 consultation is estimated to be \$9.56 million, assuming a seven percent discount rate. These costs are anticipated for development of Key Site 22 under the Orcutt Community Plan in Unit 2. Because this site is located entirely within existing critical habitat for the California tiger salamander, the delay costs are assigned to the baseline.* Note that these costs are likely overstated, because they include the impact of salamander-related development delays for some properties outside of Key Site 22 and proposed thistle critical habitat.
- **Other Activities:** Potential baseline impacts to oil and gas, agriculture and ranching, public lands management, and Vandenberg Air Force Base constitute less than one percent of the total baseline impacts, or approximately \$1.11 million, assuming a seven percent discount rate. The majority of these costs relate to oil and gas activities and stem from consideration of the thistle during oil and gas extraction and remediation/decommissioning activities. The remaining impacts are primarily administrative or managerial in nature and are often due to the presence of other listed species or other pre-existing conditions.

Incremental Impacts: Potential incremental impacts associated with the proposed critical habitat designation are estimated to be \$0.405 million to \$55.6 million (approximately \$3.63 million annualized), assuming a three percent discount rate, or \$0.355 million to \$39.6 million (approximately \$3.5 million annualized), assuming a seven percent discount rate, over the next 20 years.

Detailed Incremental Impacts: In the upper-bound scenario, potential impacts to recreation represent 99 percent of total impacts, and impacts to public lands management and development represent less than one percent of the total. There are no incremental impacts expected for agriculture, oil and gas, and Vandenberg Air Force Base.

- **Recreation:** The incremental costs of recreation-related conservation activities in Unit 1 range from \$0.041 million to \$39.3 million, assuming a seven percent discount rate. *This range is due to the uncertainty regarding impacts to OHV use; the lower bound expects no impacts to OHV ridership, while the upper-bound value reflects the closure of the five percent of the OHV riding area. If riding is not precluded by the designation, total present value impacts are anticipated to be less than \$1 million. The differences are discussed in more detail below.*
- **Public Lands Management:** Incremental costs to activities on other public lands are associated with section 7 consultations on Guadalupe-Nipomo NWR. This cost is considered incremental because consultation would not be required absent critical habitat.
- **Development:** Incremental costs to development are associated with considering adverse modification of the proposed critical habitat during section 7 consultation for the development of Key Site 22 in Unit 2.

Critical Habitat Unit with Highest Impacts: Activities in Unit 1, Callender-Guadalupe Dunes, are projected to bear the largest incremental impacts attributable to the proposed rule, representing almost 100 percent of total incremental impacts. Activities in Unit 1 are also projected to bear the greatest baseline impacts, representing 97 percent of the total..

Notes:

All impacts discussed in the Key Findings section are post-designation impacts.

* While pre-designation impacts associated with development within the proposed habitat are not presented here, they are substantial; costs to development are primarily due to the presence of California tiger salamander and conservation activities for this species.

EXHIBIT ES-2 SUMMARY OF TOTAL POST-DESIGNATION IMPACTS (PRESENT VALUE, 2008 DOLLARS)

| VALUES | BASELINE IMPACTS | | | | INCREMENTAL IMPACTS | | | |
|--------------------------|------------------|---------------|------------------|---------------|---------------------|--------------|------------------|--------------|
| | 3% DISCOUNT RATE | | 7% DISCOUNT RATE | | 3% DISCOUNT RATE | | 7% DISCOUNT RATE | |
| | LOW | HIGH | LOW | HIGH | LOW | HIGH | LOW | HIGH |
| Present Value of Impacts | \$11,000,000 | \$320,000,000 | \$10,400,000 | \$230,000,000 | \$405,000 | \$55,600,000 | \$355,000 | \$39,600,000 |
| Annualized Impact Value | \$720,000 | \$20,900,000 | \$915,000 | \$20,300,000 | \$26,500 | \$3,630,000 | \$31,300 | \$3,500,000 |

EXHIBIT ES-3 POST-DESIGNATION BASELINE IMPACTS BY UNIT AND ACTIVITY
(PRESENT VALUE, 2008 DOLLARS, HIGH-END SCENARIO)

| UNIT | VANDENBERG | RECREATION | DEVELOPMENT | AGRICULTURE | OIL & GAS | PUBLIC LANDS MANAGEMENT | UNIT SUBTOTAL |
|--|------------------|----------------------|--------------------|------------------|------------------|----------------------------|----------------------|
| 3 PERCENT DISCOUNT RATE | | | | | | | |
| 1: Callender-Guadalupe Dunes | \$0 | \$309,000,000 | \$0 | \$0 | \$533,000 | \$177,000 | <i>\$309,000,000</i> |
| 2: Santa Maria River-Orcutt Creek | \$0 | \$0 | \$9,930,000 | \$158,000 | \$342,000 | \$0 | <i>\$10,400,000</i> |
| 3: Cañada de las Flores | \$0 | \$0 | \$0 | \$97,100 | \$0 | \$0 | <i>\$97,100</i> |
| 4: San Antonio Creek | \$64,000 | \$0 | \$0 | \$0 | \$0 | \$0 | <i>\$64,000</i> |
| 5: San Antonio Terrace Dunes | \$108,000 | \$0 | \$0 | \$0 | \$0 | \$0 | <i>\$108,000</i> |
| 6: Santa Ynez River | \$36,700 | \$0 | \$0 | \$0 | \$0 | \$0 | <i>\$36,700</i> |
| Activity Subtotal | \$209,000 | \$309,000,000 | \$9,930,000 | \$255,000 | \$875,000 | \$177,000 | \$320,000,000 |
| 7 PERCENT DISCOUNT RATE | | | | | | | |
| 1: Callender-Guadalupe Dunes | \$0 | \$220,000,000 | \$0 | \$0 | \$380,000 | \$126,000 | <i>\$220,000,000</i> |
| 2: Santa Maria River-Orcutt Creek | \$0 | \$0 | \$9,560,000 | \$121,000 | \$244,000 | \$0 | <i>\$9,920,000</i> |
| 3: Cañada de las Flores | \$0 | \$0 | \$0 | \$93,500 | \$0 | \$0 | <i>\$93,500</i> |
| 4: San Antonio Creek | \$44,500 | \$0 | \$0 | \$0 | \$0 | \$0 | <i>\$44,500</i> |
| 5: San Antonio Terrace Dunes | \$75,300 | \$0 | \$0 | \$0 | \$0 | \$0 | <i>\$75,300</i> |
| 6: Santa Ynez River | \$25,500 | \$0 | \$0 | \$0 | \$0 | \$0 | <i>\$25,500</i> |
| Activity Subtotal | \$145,000 | \$220,000,000 | \$9,560,000 | \$215,000 | \$623,000 | \$126,000 | \$230,000,000 |
| Notes: | | | | | | | |
| 1. Totals may not sum due to rounding. | | | | | | | |

EXHIBIT ES-4 POST DESIGNATION INCREMENTAL IMPACTS BY UNIT AND ACTIVITY
(PRESENT VALUE, 2008 DOLLARS, HIGH-END SCENARIO)

| UNIT | VANDENBERG | RECREATION | DEVELOPMENT | AGRICULTURE | OIL & GAS | PUBLIC LANDS MANAGEMENT | UNIT SUBTOTAL |
|--|------------|---------------------|----------------|-------------|------------|-------------------------|---------------------|
| 3 PERCENT DISCOUNT RATE | | | | | | | |
| 1: Callender-Guadalupe Dunes | \$0 | \$55,200,000 | \$0 | \$0 | \$0 | \$297,000 | \$55,500,000 |
| 2: Santa Maria River-Orcutt Creek | \$0 | \$0 | \$4,850 | \$0 | \$0 | \$48,300 | \$53,200 |
| 3: Cañada de las Flores | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 4: San Antonio Creek | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 5: San Antonio Terrace Dunes | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 6: Santa Ynez River | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Activity Subtotal | \$0 | \$55,200,000 | \$4,850 | \$0 | \$0 | \$346,000 | \$55,600,000 |
| 7 PERCENT DISCOUNT RATE | | | | | | | |
| 1: Callender-Guadalupe Dunes | \$0 | \$39,300,000 | \$0 | \$0 | \$0 | \$271,000 | \$39,600,000 |
| 2: Santa Maria River-Orcutt Creek | \$0 | \$0 | \$4,670 | \$0 | \$0 | \$38,300 | \$43,000 |
| 3: Cañada de las Flores | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 4: San Antonio Creek | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 5: San Antonio Terrace Dunes | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 6: Santa Ynez River | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Activity Subtotal | \$0 | \$39,300,000 | \$4,670 | \$0 | \$0 | \$309,000 | \$39,600,000 |
| Notes: | | | | | | | |
| 1. Totals may not sum due to rounding. | | | | | | | |

EXHIBIT ES-5 UNITS RANKED BY INCREMENTAL IMPACTS (PRESENT VALUE 2008 DOLLARS, HIGH-END SCENARIO)

| UNIT | PRESENT VALUE IMPACTS (3% DISCOUNT RATE) | PERCENTAGE OF IMPACTS (3% DISCOUNT RATE) | PRESENT VALUE IMPACTS (7% DISCOUNT RATE) | PERCENTAGE OF IMPACTS (7% DISCOUNT RATE) |
|-----------------------------------|---|---|---|---|
| 1: Callender-Guadalupe Dunes | \$55,500,000 | 99.90% | \$39,600,000 | 99.89% |
| 2: Santa Maria River-Orcutt Creek | \$53,200 | 0.10% | \$43,000 | 0.11% |
| 3: Cañada de las Flores | \$0 | 0.00% | \$0 | 0.00% |
| 4: San Antonio Creek | \$0 | 0.00% | \$0 | 0.00% |
| 5: San Antonio Terrace Dunes | \$0 | 0.00% | \$0 | 0.00% |
| 6: Santa Ynez River | \$0 | 0.00% | \$0 | 0.00% |
| Total | \$55,600,000 | | \$39,600,000 | |

SUMMARY OF BASELINE IMPACTS

6. Baseline impacts are estimated to be \$11.0 million to \$320 million (approximately \$20.9 million annualized), assuming a three percent discount rate, or \$10.4 million to \$230 million (approximately \$20.3 million annualized), assuming a seven percent discount rate. Impacts to recreation represent between 96 and 97 percent of the total post-designation baseline impacts, depending on the discount rate, followed by development, which represents three to four percent of the total under the high-end scenario. Impacts to all other activities represent less than one percent of the total impacts.

RECREATION

7. Baseline impacts to recreation range from \$0.014 million to \$220 million, assuming a seven percent discount rate. This large range reflects the various possible outcomes for future use and ownership of La Grande Tract in ODSVRA. La Grande Tract is comprised of county-owned lands currently under a month-to-month operating agreement with ODSVRA. This analysis quantifies the impacts of two distinct scenarios:
- In the lower-bound scenario, OHV use in ODSVRA continues unimpeded. This scenario represents several potential outcomes, including: La Grande Tract continues to be operated as part of ODSVRA; visitation is not affected by the closure of La Grande Tract; or OHV recreators are able to substitute to other areas without a loss in consumer surplus or a change in spending patterns.
 - In the upper-bound scenario, La Grande Tract is closed to riding. This scenario reflects the assumption that some people who would have made a trip to ODSVRA for OHV recreation will choose not to due to the closure of La Grande Tract. Under this scenario, the majority (almost 100 percent) of the post-designation baseline impacts to recreation result from the loss of consumer surplus experienced by OHV riders. If closure of La Grande Tract does not happen or if total visitation is not affected by the closure (i.e. riders are able to substitute to other areas without a loss in consumer surplus), this upper-bound welfare loss estimate would not be experienced.

Also included in the baseline impacts to recreation is the administrative cost of addressing the jeopardy standard in CDPR's consultation with the Service for approval of its HCP.

8. If riding is prohibited or restricted within La Grande Tract, the regional economy may also be adversely affected. Relying on the results of a previous study of the economic contribution of ODSVRA to San Luis Obispo County, the closure may result in an initial impact of \$30.5 million in reduced economic output or a loss of 432 jobs within the county. Note that these impacts represent the initial disruption to the economy caused by this event.

RESIDENTIAL AND COMMERCIAL DEVELOPMENT

9. Development impacts are only expected in Unit 2 and are associated with Key Site 22 in Orcutt. The main cost expected in the post-designation period results from delayed construction during the section 7 consultation process; this impact is estimated to be \$9.56 million, assuming a seven percent discount rate.⁶ The loss is based on the opportunity cost to developers of carrying undeveloped land during that time period. Because the timing of future development is unknown, this analysis conservatively assumes that the loss occurs in 2009. As a result, delay costs may be overstated.

OIL AND GAS OPERATIONS

10. Baseline costs for protection of the thistle are expected in Units 1 and 2. In Unit 1, impacts derive from consideration of the thistle during remediation and decommissioning activities of the Guadalupe Oil Field. These activities are occurring as part of an extensive restoration program required by the county in that area. In Unit 2, baseline costs are associated with consideration of the thistle during reinitiation of inactive wells. These costs result from voluntary activities undertaken by companies to monitor environmental impacts; the review process stipulated by the California Environmental Quality Act (CEQA) is not required for reactivation of existing wells, and there is no apparent nexus for oil and gas activity within the proposed designation at this time. Impacts may also occur if new wells are drilled; however, projecting such activity is beyond the scope of this analysis.

AGRICULTURE AND RANCHING

11. Baseline costs for agriculture and ranching are expected in Units 2 and 3. Four cooling facility and/or processing plant projects are expected to occur in Unit 2 over the next 20 years. The expense of preparing an EIR for these projects is considered a baseline impact. The cost of preparing an EIR for two vineyard conversion projects in Unit 3 is also considered a baseline impact due to the presence of California tiger salamander. Data necessary to estimate delay costs associated with these projects are not available at the writing of this report.

PUBLIC LANDS MANAGEMENT

12. Guadalupe-Nipomo Dunes NWR expects to maintain fencing and continue surveying the refuge for thistle in the future. These management activities are considered baseline impacts because they are done to protect the thistle itself and would be carried out in the absence of critical habitat.

⁶ Note the value of the affected land is obtained from a previous analysis of the impacts of critical habitat designation for the California tiger salamander in the same area. This value includes acres outside of Key Site 22 and proposed critical habitat for the thistle, and therefore overstates the impacts associated with this project.

VANDENBERG AIR FORCE BASE

13. Biological surveys of project sites for sensitive habitats and species, including the thistle, represent the primary conservation activity currently conducted by Vandenberg Air Force Base. These are considered baseline costs because surveys would be conducted regardless of the designation of critical habitat. The Base is in the process of finalizing its draft Integrated Natural Resource Management Plan (INRMP). While the INRMP is being finalized, management activities for the thistle and its habitat will be guided by the Endangered Species Management Plan for La Graciosa Thistle (ESMP); management actions outlined in this document will be incorporated into the final INRMP. Costs associated with actions outlined in the ESMP are not able to be quantified at the writing of this report.

SUMMARY OF INCREMENTAL IMPACTS

14. Incremental impacts associated with the proposed critical habitat designation are estimated to be \$0.405 million to \$55.6 million (approximately \$3.63 million annualized), assuming a three percent discount rate, or \$0.355 million to \$39.6 million (approximately \$3.5 million annualized), assuming a seven percent discount rate, over the next 20 years. By far the largest contributor to the high-end incremental costs is the potential exclusion of OHV use in five percent of the riding area at ODSVA in Unit 1. Incremental costs are also expected related to public lands management in Units 1 and 2, and residential and commercial development in Unit 2.

RECREATION

15. The effect of critical habitat designation in the riding areas of ODSVRA is uncertain. This analysis quantifies the impacts of two separate management scenarios.
- In the lower-bound scenario, OHV use in ODSVRA continues unimpeded. This scenario represents several potential outcomes, including: designation of critical habitat does not lead to closure of any portion of the riding area; visitation is not affected by any potential closures; or OHV recreators are able to substitute to other areas without a loss in consumer surplus or a change in spending patterns.
 - In the upper-bound scenario, riding is prohibited in five percent of the riding area. Under this scenario, the majority (almost 100 percent) of the post-designation incremental impacts to recreation result from the loss of consumer surplus experienced by OHV riders. Consumer surplus is lost by riders who either do not visit ODSVRA or whose visits are reduced in value due to the closure. It should be noted that these welfare losses represent upper-bound impacts. If closure of less than five percent of the riding area occurs, or if visitation and value is not affected by the closure, this upper-bound welfare loss estimate would not be reached. The Service has indicated a “mostly likely impact” of 2.4 percent, which falls within the range presented in this analysis.

Also included in the incremental impacts are the costs of fence installation and maintenance needed to close a portion of the riding area and the administrative costs associated with addressing the adverse modification standard during the Service's internal section 7 consultation.

16. If riding is prohibited within designated critical habitat, the regional economy may also be adversely affected. Relying on the results of a previous study of the economic contribution of ODSVRA to San Luis Obispo County, the closure may result in an initial impact of \$5.49 million in reduced economic output or a loss of 78 jobs within the county. Note that these impacts represent the initial disruption to the economy caused by this event.

PUBLIC LANDS MANAGEMENT

17. Guadalupe-Nipomo Dunes NWR expects to undertake an average of four projects per year until the completion of their HCP in 2012. Because the consultation record in Guadalupe-Nipomo Dunes NWR is so minimal and no detail on the nature of these projects is available, all future consultation costs are attributed to the critical habitat designation. Rancho Guadalupe Dunes County Park expects to close a 43-acre portion of the park that has been proposed for designation as critical habitat for the thistle. This activity would not occur in the absence of critical habitat, and thus, costs associated with this activity are considered incremental.

RESIDENTIAL AND COMMERCIAL DEVELOPMENT

18. The only incremental cost expected for development is the cost of considering adverse modification during the Section 7 consultation process. Other incremental impacts may also occur if land set-asides occurring in the baseline for the California tiger salamander cannot be configured in a way to provide adequate protection for the thistle. In the event that critical habitat for the salamander is removed or altered incremental costs for considering the thistle and its habitat could increase significantly.

SMALL BUSINESS AND ENERGY IMPACTS

19. The analysis considers two scenarios due to the uncertainty regarding the future management of OHV use at ODSVRA in response to critical habitat designation. In the lower-bound scenario, riding is not affected, and no loss of visitation is anticipated. If, however, five percent of the riding area is closed, as modeled in the upper-bound scenario, fewer visitors are assumed to come to San Luis Obispo County, adversely affecting small businesses catering to these travelers. Across the relevant lodging, food and beverage, and automotive related sectors, approximately 85 percent of the entities in the county are small, and approximately 0.37 percent of the annual sales of these businesses could be lost.
20. The proposed rule is not anticipated to constitute a significant energy action. Oil and gas development in the study area is anticipated to result primarily from the reactivation of existing wells, which generally will not result in incremental impacts. Thus, this analysis

assumes no increase in the cost of energy production due to the critical habitat designation for the thistle. It should be noted that incremental impacts may be incurred in areas where new oil and gas exploration or production occurs. However projecting these impacts given the uncertainty of future oil and gas activity is beyond the scope of this analysis.

CHAPTER 1 | BACKGROUND

1.1 INTRODUCTION

21. This section provides a brief introduction to the revised proposed critical habitat for the thistle. It includes a summary of past publications and legal actions that relate to the current proposal, a summary of land ownership within the current proposal, a map of the proposed units, and a summary of threats to the proposed critical habitat. This information is intended to provide background information to the reader. All official definitions and boundaries should be taken from the Proposed Rule.⁷

1.2 PREVIOUS FEDERAL ACTIONS

22. In 1990 the State of California listed the thistle as threatened under the California Endangered Species Act (CESA). A Final Rule listing the thistle as endangered under the Act was published on March 20, 2000.⁸ Subsequently, the Service designated critical habitat for the thistle in San Luis Obispo and Santa Barbara Counties, California on March 17, 2004.⁹ Then, on March 30, 2005, the Homebuilders Association of Northern California et al. filed a complaint against the Service alleging that the final rule designating critical habitat for the thistle violated the Act, the Administrative Procedure Act, and the National Environmental Policy Act.¹⁰ In March 2006 a settlement was reached to re-evaluate the 2004 critical habitat designation. Most recently, on August 6, 2008, the Service published a Proposed Rule revising the designation of critical habitat for the thistle.¹¹ This economic analysis addresses the August 6, 2008 proposed rule to revise the critical habitat designation for the thistle.

1.3 PROPOSED CRITICAL HABITAT DESIGNATION

23. The 2004 critical habitat rule for the thistle consisted of two units comprising a total of 41,090 acres. The proposed revision includes six units comprising a total of 38,447 acres. The decrease in acreage is due primarily to the removal of large areas of privately-owned agricultural fields that do not contain the appropriate spatial arrangement, quantity, or

⁷ 2008 Proposed Rule, 73 FR 45806.

⁸ 2000 Final Listing Rule, 65 FR 14888.

⁹ 2004 Final Rule, 69 FR 12553.

¹⁰ Homebuilders Association of N. Cal., et al. v. U.S. Fish and Wildlife Service, et al., No. 2:05-01363, E.D. Cal.

¹¹ 2008 Proposed Rule, 73 FR 45806.

quality of the features essential to the conservation of the species.¹² Exhibit ES-1 depicts the proposed critical habitat units.

24. Units 4 (San Antonio Creek), 5 (San Antonio Terrace Dunes), and 6 (Santa Ynez River) were considered to be unoccupied at time of listing and are currently considered to be unoccupied. Unit 3, Cañada de las Flores, (Unit 2, Cañada de las Flores, in the 2004 rule) was considered to be occupied at the time of listing and occupied at the time of the 2004 final designation, but is now considered to be unoccupied. Units 1 (Callender-Guadalupe Dunes) and 2 (Santa Maria River-Orcutt Creek) were considered to be occupied at time of listing and are currently considered to be occupied.
25. Exhibit 1-1 provides information concerning land ownership for the proposed habitat by unit. No areas are explicitly considered for exclusion from designation in the proposed rule. The Service is not currently aware of any non-federal public or private lands covered by an existing operative habitat conservation plan (HCP) and incidental take permit that may be excluded from designation under section 4(b)(2) of the Act. Lands at Vandenberg Air Force Base are not excluded under section 4(a)(3) of the Act because the Base only has a draft INRMP.

1.4 THREATS TO CRITICAL HABITAT AREAS

26. The proposed rule identifies “direct and indirect effects from energy-related operations (i.e., maintenance activities, hazardous waste cleanup); development that results in additional habitat modification (i.e., agricultural and urban development); facility accidents by oil companies or Vandenberg Air Force Base; groundwater extraction in the Guadalupe Dunes vicinity; hydrological alterations; direct and indirect effects from off highway vehicle (OHV) activity; small population size; and habitat fragmentation and loss through the invasion of aggressive nonnative weeds” as threats to thistle.¹³ This report describes and quantifies the potential economic impacts associated with proposed critical habitat designation for the thistle in relation to the threats identified by the Service. Because several named threats address broad impacts that could require project changes within a number of industry types, threats were reclassified by potentially affected activity or industry. Specifically, the report is organized into six primary sections that capture the threats as described in the rule. These are: Vandenberg Air Force Base, Recreation, Residential/Commercial Development, Agriculture and Ranching, Oil and Gas Operations, and Public Lands Management.

¹² 2008 Proposed Rule, 73 FR 45818.

¹³ 2008 Proposed Rule, 73 FR 45816.

EXHIBIT 1-1 SUMMARY OF LANDOWNERSHIP IN PROPOSED CRITICAL HABITAT FOR LA GRACOSA THISTLE BY UNIT

| UNIT | COUNTY | MAJOR LANDOWNER(S)/LAND MANAGER(S) | LANDOWNERS (ACRES) | | | | |
|---|-----------------------------------|--|--------------------|--------------|---|---------------|---------------|
| | | | FEDERAL | STATE | COUNTY AND OTHER LOCAL JURISDICTIONS | PRIVATE | TOTAL |
| 1: Callender-Guadalupe Dunes | San Luis Obispo | <ul style="list-style-type: none"> • Guadalupe-Nipomo Dunes National Wildlife Refuge • Pismo Dunes State Preserve • Oceano Dunes State Vehicular Recreation Area (SVRA) (includes leased county lands) • Private | 2,428 | 2,414 | 349 | 5,138 | 10,329 |
| 2: Santa Maria River-Orcutt Creek | San Luis Obispo and Santa Barbara | <ul style="list-style-type: none"> • Rancho Guadalupe Dunes Park • Private | 0 | 329 | 465 | 12,433 | 13,227 |
| 3: Cañada de las Flores | Santa Barbara | <ul style="list-style-type: none"> • Private | 0 | 0 | 0 | 740 | 740 |
| 4: San Antonio Creek | Santa Barbara | <ul style="list-style-type: none"> • Vandenberg Air Force Base | 4,149 | 0 | 0 | 186 | 4,335 |
| 5: San Antonio Terrace Dunes | Santa Barbara | <ul style="list-style-type: none"> • Vandenberg Air Force Base | 7,282 | 0 | 0 | 52 | 7,334 |
| 6: Santa Ynez River | Santa Barbara | <ul style="list-style-type: none"> • Vandenberg Air Force Base | 2,401 | 0 | 38 | 43 | 2,482 |
| TOTAL: | | | 16,260 | 2,743 | 852 | 18,592 | 38,447 |
| Percent of Total: | | | 42% | 7% | 2% | 48% | |
| Source: 2008 Proposed Rule, 73 FR 45818. | | | | | | | |
| Note: Totals may not sum due to rounding. | | | | | | | |

1.5 STRUCTURE OF THE REPORT

27. The remainder of this report is organized as follows:

- Chapter 2: Framework for the Analysis;
- Chapter 3: Baseline Regulations;
- Chapter 4: Vandenberg Air Force Base;
- Chapter 5: Recreation;
- Chapter 6: Residential and Commercial Development;
- Chapter 7: Agriculture and Ranching;
- Chapter 8: Oil and Gas Operations;
- Chapter 9: Other Public Lands Management;
- References;
- Appendix A: Small Business and Energy Impact Analysis;
- Appendix B: Literature Review by Dr. J.R. DeShazo;
- Appendix C: Three Percent Discount Rate Exhibits; and
- Appendix D: Undiscounted Stream of Impacts.

CHAPTER 2 | FRAMEWORK FOR THE ANALYSIS

28. The purpose of this report is to estimate the economic impact of actions taken to protect the federally-listed thistle and its habitat. This analysis examines the impacts of restricting or modifying specific land uses or activities for the benefit of the species and its habitat within the areas considered for critical habitat designation. This analysis employs "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections already accorded the thistle; for example, under the Federal listing and other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat for the thistle. The analysis looks retrospectively at baseline impacts incurred since the species was listed, and forecasts both baseline and incremental impacts likely to occur after the proposed critical habitat is finalized.
29. This information is intended to assist the Secretary of the U.S. Department of the Interior (DOI) in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.¹⁴ In addition, this information allows the Service to address the requirements of Executive Orders (E.O.) 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).¹⁵
30. This section describes the framework for the analysis. First, it describes the case law that led to the selection of the framework applied in this report. It then describes in economic terms the general categories of economic effects that are the focus of regulatory impact analysis, including a discussion of both efficiency and distributional effects. Next, this section defines the analytic framework used to measure these impacts in the context of critical habitat regulation, including the link between existing and critical habitat-related protection efforts and potential impacts, and the consideration of benefits. It concludes with a presentation of the information sources relied upon in the analysis and the structure of the report.

¹⁴ 16 U.S.C. §1533(b)(2).

¹⁵ E.O. 12866, Regulatory Planning and Review, September 30, 1993 (as amended by E.O. 13258 (2002) and E.O. 13422 (2007)); E.O. 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.

2.1 BACKGROUND

31. The U.S. Office of Management and Budget's (OMB) guidelines for conducting economic analysis of regulations direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action."¹⁶ In other words, the baseline includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e., occurring over and above existing constraints) are attributable to the proposed regulation. Significant debate has occurred regarding whether assessing the impacts of the Service's proposed regulations using this baseline approach is appropriate in the context of critical habitat designations.

32. In 2001, the U.S. Tenth Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, regardless of whether those impacts are attributable co-extensively to other causes.¹⁷ Specifically, the court stated,

“The statutory language is plain in requiring some kind of consideration of economic impact in the CHD [critical habitat designation] phase. Although 50 C.F.R. 402.02 is not at issue here, the regulation's definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless. We are compelled by the canons of statutory interpretation to give some effect to the congressional directive that economic impacts be considered at the time of critical habitat designation.... Because economic analysis done using the FWS's [Fish and Wildlife Service's] baseline model is rendered essentially without meaning by 50 C.F.R. § 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes. Thus, we hold the baseline approach to economic analysis is not in accord with the language or intent of the ESA [Endangered Species Act].”¹⁸

33. Since that decision, however, courts in other cases have held that an incremental analysis of impacts stemming solely from the critical habitat rulemaking is proper.¹⁹ For example, in the March 2006 ruling that the August 2004 critical habitat rule for the Peirson's milk-vetch was arbitrary and capricious, the United States District Court for the Northern District of California stated,

¹⁶ OMB, “Circular A-4,” September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

¹⁷ *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

¹⁸ *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

¹⁹ *Cape Hatteras Access Preservation Alliance v. Department of Interior*, 344 F. Supp. 2d 108 (D.D.C.); *Center for Biological Diversity v. United States Bureau of Land Management*, 422 F. Supp. 2d 1115 (N.D. Cal. 2006).

“The Court is not persuaded by the reasoning of *New Mexico Cattle Growers*, and instead agrees with the reasoning and holding of *Cape Hatteras Access Preservation Alliance v. U.S. Dep’t of the Interior*, 344 F. Supp 2d 108 (D.D.C. 2004). That case also involved a challenge to the Service’s baseline approach and the court held that the baseline approach was both consistent with the language and purpose of the ESA and that it was a reasonable method for assessing the actual costs of a particular critical habitat designation *Id* at 130. ‘To find the true cost of a designation, the world with the designation must be compared to the world without it.’”²⁰

34. In order to address the divergent opinions of the courts and provide the most complete information to decision-makers, this economic analysis reports both:
- a. The baseline impacts of thistle conservation from protections afforded the species absent critical habitat designation; and
 - b. The estimated incremental impacts precipitated specifically by the designation of critical habitat for the species.

Summed, these two types of impacts comprise the fully co-extensive impacts of thistle conservation in areas considered for critical habitat designation.

35. Incremental effects of critical habitat designation are determined using the Service's December 9, 2004 interim guidance on “Application of the ‘Destruction or Adverse Modification’ Standard Under Section 7(a)(2) of the Endangered Species Act” and information from the Service regarding what potential consultations and project modifications may be imposed as a result of critical habitat designation over and above those associated with the listing.²¹ Specifically, in *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, the Ninth Circuit invalidated the Service’s regulation defining destruction or adverse modification of critical habitat, and the Service no longer relies on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat.²² Under the statutory provisions of the Act, the Service determines destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional to serve its intended conservation role for the species. A detailed description of the methodology used to define baseline and incremental impacts is provided later in this section.

²⁰ *Center for Biological Diversity et al, Plaintiffs, v. United States Bureau of Land Management et. al, Defendants and American Sand Association, et al, Defendant Intervenors*, Order re: Cross Motions for Summary Judgment, Case 3:03-cv-02509 Document 174 Filed 03/14/2006, pages 44-45.

²¹ Director, U.S. Fish and Wildlife Service, Memorandum to Regional Directors and Manager of the California-Nevada Operations Office, Subject: Application of the “Destruction or Adverse Modification” Standard under Section 7(a)(2) of the Endangered Species Act, dated December 9, 2004.

²² *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, No. 03-35279 (9th Circuit 2004).

2.2 CATEGORIES OF POTENTIAL ECONOMIC EFFECTS OF SPECIES CONSERVATION

36. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the thistle and its habitat. Economic efficiency effects generally reflect “opportunity costs” associated with the commitment of resources required to accomplish species and habitat conservation. For example, if the set of activities that may take place on a parcel of land is limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of thistle conservation efforts.
37. 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 species conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts. The differences between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

2.2.1 EFFICIENCY EFFECTS

38. At the guidance of OMB and in compliance with E.O. 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 thistle 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.²³
39. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager, such as the U.S. Army Corps of Engineers (USACE), may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets -- that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or

²³ 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>.

service demanded given a change in price -- the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.

40. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, protection measures that reduce or preclude the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market.
41. This analysis begins by measuring impacts associated with efforts undertaken to protect thistle 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.

2.2.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

42. 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.²⁴ 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

43. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the Regulatory Flexibility Act, might be affected by future species conservation efforts.²⁵ In addition, in response to E.O. 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.²⁶

²⁴ 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>.

²⁵ 5 U.S.C. §§601 *et seq.*

²⁶ E.O. 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

Regional Economic Effects

44. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreators) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreators). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.
45. The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by affected 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.
46. 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.

2.3 ANALYTIC FRAMEWORK AND SCOPE OF THE ANALYSIS

47. This analysis identifies those economic activities most likely to threaten the listed species and its habitat and, where possible, quantifies the economic impact to avoid or minimize such threats within the boundaries of the study area (the geographic boundaries of the study area are described later in this Section). This section provides a description of the methodology used to separately identify baseline impacts and incremental impacts stemming from the proposed designation of critical habitat for the thistle. This evaluation of impacts in a "with critical habitat designation" versus a "without critical habitat designation" framework effectively measures the net change in economic activity associated with the proposed rulemaking.

2.3.1 IDENTIFYING BASELINE IMPACTS

48. The baseline for this analysis is the existing state of regulation, prior to the designation of critical habitat, that provides protection to the species under the Act, as well as under other Federal, State and local laws and guidelines. This "without critical habitat designation" scenario also considers a wide range of additional factors beyond the compliance costs of regulations that provide protection to the listed species. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by the Service and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.
49. Baseline impacts include sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections to the extent that they are expected to occur absent the designation of critical habitat for the species.
- Section 7 of the Act, absent critical habitat designation, requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. The portion of the administrative costs of consultations under the jeopardy standard, along with the impacts of project modifications resulting from consideration of this standard, are considered baseline impacts. Baseline administrative costs of section 7 consultation are summarized later in Exhibit 2-2.
 - 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."²⁷ The economic impacts associated with this section are manifested in sections 7 and 10. While incidental take permits are not issued for plant species such as the La Graciosa thistle, the Service is obligated to ensure that proposed activities adequately minimize impact to the species.
 - 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 a listed 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.²⁸ The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately avoided or minimized. The development and implementation of HCPs is considered a baseline protection for the species and habitat unless the HCP is determined to be

²⁷ 16 U.S.C. 1538 and 16 U.S.C. 1532.

²⁸ U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning." From: <http://endangered.fws.gov/hcp/>, as viewed on August 6, 2002. While HCPs are not typically developed specifically for listed plant species, an HCP may include listed or non-listed plant species that may be affected by the project subject to the HCP.

precipitated by the designation of critical habitat, or the designation influences stipulated conservation efforts under HCPs. While HCPs are not developed solely for plant species, if listed plants occur in the area subject to the HCP, the Service must consider whether the proposed activities may adversely affect or jeopardize the continued existence of the plant species. For example, the La Graciosa thistle may be included in an HCP developed for listed species, such as the California tiger salamander, within thistle critical habitat.

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

50. In the case of the thistle, critical habitat was previously designated in 2004.²⁹ The impacts of historical efforts to conserve critical habitat are assigned to the baseline, as these costs have already been incurred and therefore are unaffected by the proposed rule. In the future, the analysis assumes that the existing critical habitat is no longer in place as it has been revised by the new designation. To the extent that the study area for this analysis overlaps with the formerly designated habitat, future impacts attributable solely to critical habitat designation are attributed to the proposed rule currently under consideration.
51. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. If compliance with the Clean Water Act or State environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are categorized accordingly. Of note, however, is that such efforts may not be considered baseline in the case that they would not have been triggered absent the designation of critical habitat. In these cases, they are considered incremental impacts and are discussed below.

2.3.2 IDENTIFYING INCREMENTAL IMPACTS

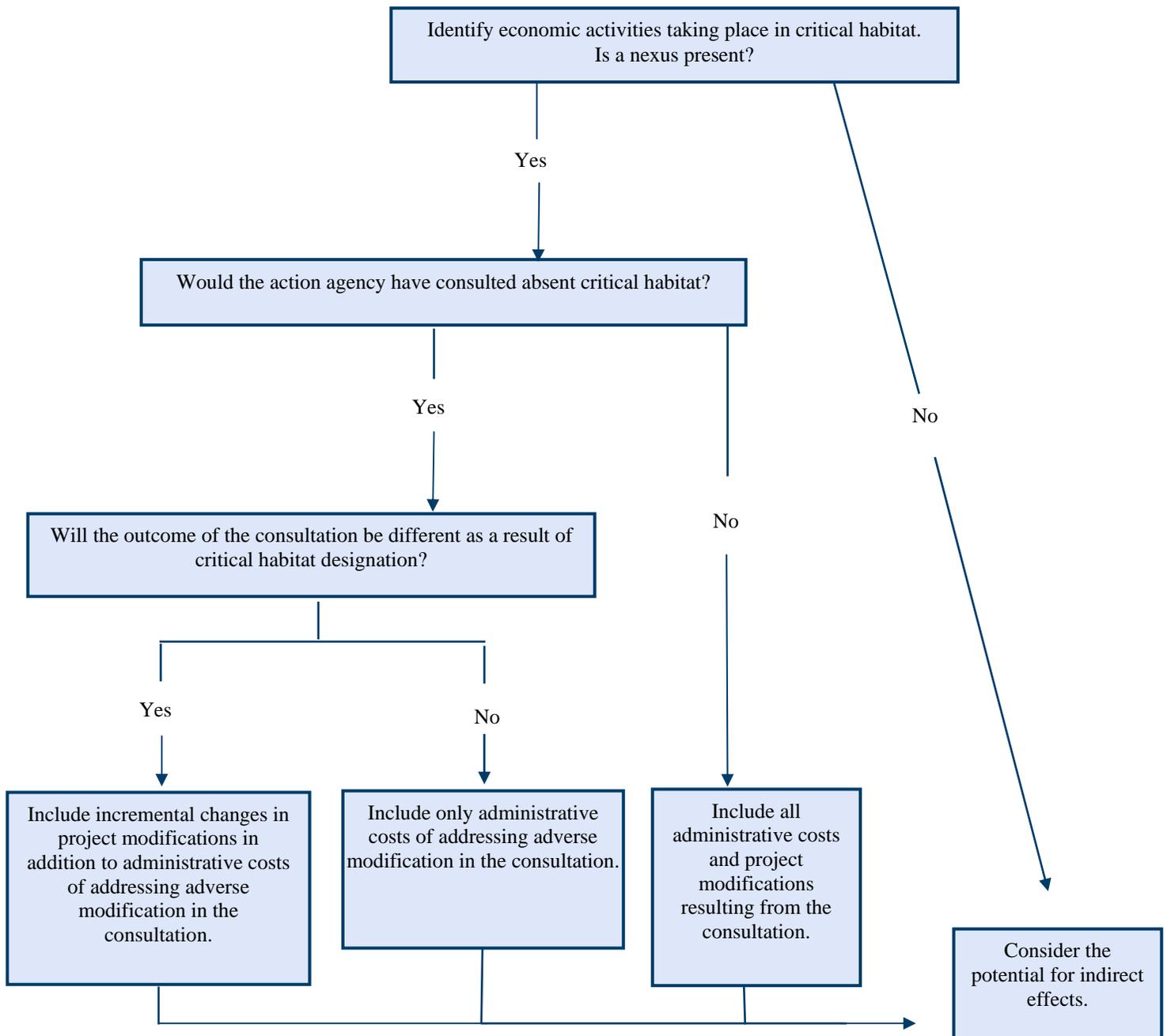
52. This analysis separately quantifies the incremental impacts of this rulemaking. The focus of the incremental analysis is to determine the impacts on land uses and activities from the designation of critical habitat that are above and beyond those impacts due to existing required or voluntary conservation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

²⁹ 2004 Final Rule, 69 FR 12553.

compliance costs of designating critical habitat. These costs are not in the baseline and are considered incremental impacts of the rulemaking.

54. Exhibit 2-1 depicts the decision analysis regarding whether an impact should be considered incremental. The following sections describe this decision tree in detail.

EXHIBIT 2-1 IDENTIFYING INCREMENTAL IMPACTS OF CRITICAL HABITAT DESIGNATION



55. Incremental impacts may be the direct compliance costs associated with additional effort to forecast consultations, reinitiated consultations, new consultations occurring specifically because of the designation, and additional project modifications that would not have been required under the jeopardy standard. Additionally, incremental impacts may include indirect impacts resulting from reaction to the potential designation of critical habitat (e.g., developing HCPs in an effort to avoid designation of critical habitat), triggering of additional requirements under State or local laws intended to protect sensitive habitat, and uncertainty and perceptual effects on markets.

Direct Impacts

56. The direct, incremental impacts of critical habitat designation stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct, incremental impacts of critical habitat designation are: 1) the administrative costs of conducting section 7 consultation; and 2) implementation of any project modifications requested by the Service through section 7 consultation to avoid or minimize potential destruction or adverse modification of critical habitat.

Administrative Section 7 Consultation Costs

57. Parties involved in section 7 consultations include the Service, a Federal "action agency," and in some cases, a private entity involved in the project or land use activity. The action agency (i.e., the Federal nexus necessitating the consultation) serves as the liaison with the Service. While consultations are required for activities that involve a Federal nexus and may jeopardize the continued existence of the species regardless of whether critical habitat is designated, the designation may increase the effort for consultations in the case that the project or activity in question may adversely modify critical habitat. Administrative efforts for consultation may therefore result in both baseline and incremental impacts.
58. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:
1. **Additional effort to address adverse modification in a new consultation**
- New consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond the listing issues. In this case, only the additional administrative effort required to consider critical habitat is considered an incremental impact of the designation.
 2. **Re-initiation of consultation to address adverse modification -**
Consultations that have already been completed on a project or activity may require re-initiation to address critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and

project modification costs are considered incremental impacts of the designation.

3. **Incremental consultation resulting entirely from critical habitat designation** - Critical habitat designation may trigger additional consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the potential presence of the species provided by the designation). Such consultations may, for example, be triggered in critical habitat areas that are not occupied by the species. All associated administrative and project modification costs of incremental consultations are considered incremental impacts of the designation.

59. The administrative costs of these consultations vary depending on the specifics of the project. One way to address this variability is to show a range of possible costs of consultation, as it may not be possible to predict the precise outcome of each future consultation in terms of level of effort. Review of consultation records and discussions with Service field offices resulted in a range of estimated administrative costs of consultation. For simplicity, the average of the range of costs in each category is applied in this analysis.
60. Exhibit 2-2 provides estimated administrative consultation costs representing effort required for all types of consultation, including those that considered both adverse modification and jeopardy. To estimate the fractions of the total administrative consultation costs that are baseline and incremental, the following assumptions were applied.
- The greatest effort will be associated with consultations that consider both jeopardy and adverse modification. Depending on whether the consultation is precipitated by the listing or the critical habitat designation, part or all of the costs, respectively, will be attributed to the proposed rule.
 - Efficiencies exist when considering both jeopardy and adverse modification at the same time (e.g., in staff time saved for project review and report writing), and therefore incremental administrative costs of considering adverse modification in consultations precipitated by the listing result in the least incremental effort, roughly one-quarter of the cost of the entire consultation. The remaining three-quarters of the costs are attributed to consideration of the jeopardy standard in the baseline scenario. This latter amount also represents the cost of a consultation that only considers adverse modification (e.g., an incremental consultation for activities in unoccupied critical habitat) and is attributed wholly to critical habitat.
 - Incremental costs of the re-initiation of a previously completed consultation because of the critical habitat designation are assumed to be approximately half the cost of a consultation considering both jeopardy and adverse modification. This assumes that re-initiations are less time-consuming as the groundwork for the project has already been considered in terms of its effect on the species. However,

because the previously completed effort must be re-opened, they are more costly than simply adding consideration of critical habitat to a consultation already underway.

Section 7 Project Modification Impacts

61. Section 7 consultation considering critical habitat may also result in additional project modification recommendations specifically addressing potential destruction or adverse modification of critical habitat. For forecast consultations considering jeopardy and adverse modification, and for re-initiations of past consultations to consider critical habitat, the economic impacts of project modifications undertaken to avoid or minimize adverse modification are considered incremental impacts of critical habitat designation. For consultations that are forecast to occur specifically because of the designation (incremental consultations), impacts of all associated project modifications are assumed to be incremental impacts of the designation. This is summarized below.
1. **Additional effort to address adverse modification in a new consultation** - Only project modifications above and beyond what would be requested to avoid or minimize jeopardy are considered incremental.
 2. **Re-initiation of consultation to address adverse modification** - Only project modifications above and beyond what was requested to avoid or minimize jeopardy are considered incremental.
 3. **Incremental consultation resulting entirely from critical habitat designation** - Impacts of all project modifications are considered incremental.

EXHIBIT 2-2 RANGE OF ADMINISTRATIVE CONSULTATION COSTS (2008 DOLLARS)

| BASELINE ADMINISTRATIVE COSTS OF CONSULTATION | | | | | |
|--|----------|----------------|-------------|-----------------------|-------------|
| CONSULTATION TYPE | SERVICE | FEDERAL AGENCY | THIRD PARTY | BIOLOGICAL ASSESSMENT | TOTAL COSTS |
| NEW CONSULTATION CONSIDERING JEOPARDY (DOES NOT INCLUDE CONSIDERATION OF ADVERSE MODIFICATION) | | | | | |
| Technical Assistance | \$405 | n/a | \$788 | n/a | \$1,130 |
| Informal | \$1,760 | \$2,250 | \$1,540 | \$1,500 | \$7,130 |
| Formal | \$3,980 | \$4,500 | \$2,630 | \$3,600 | \$15,000 |
| Programmatic | \$12,000 | \$9,940 | n/a | \$4,200 | \$26,100 |
| INCREMENTAL ADMINISTRATIVE COSTS OF CONSULTATION | | | | | |
| CONSULTATION TYPE | SERVICE | FEDERAL AGENCY | THIRD PARTY | BIOLOGICAL ASSESSMENT | TOTAL COSTS |
| NEW CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION (TOTAL COST OF A CONSULTATION CONSIDERING BOTH JEOPARDY AND ADVERSE MODIFICATION) | | | | | |
| Technical Assistance | \$540 | n/a | \$1,050 | n/a | \$1,500 |
| Informal | \$2,350 | \$3,000 | \$2,050 | \$2,000 | \$9,500 |
| Formal | \$5,300 | \$6,000 | \$3,500 | \$4,800 | \$20,000 |
| Programmatic | \$16,000 | \$13,300 | n/a | \$5,600 | \$34,800 |
| NEW CONSULTATION CONSIDERING ONLY ADVERSE MODIFICATION (UNOCCUPIED HABITAT) | | | | | |
| Technical Assistance | \$405 | n/a | \$788 | n/a | \$1,130 |
| Informal | \$1,760 | \$2,250 | \$1,540 | \$1,500 | \$7,130 |
| Formal | \$3,980 | \$4,500 | \$2,630 | \$3,600 | \$15,000 |
| Programmatic | \$12,000 | \$9,940 | n/a | \$4,200 | \$26,100 |
| RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION | | | | | |
| Technical Assistance | \$270 | n/a | \$525 | n/a | \$750 |
| Informal | \$1,180 | \$1,500 | \$1,030 | \$1,000 | \$4,750 |
| Formal | \$2,650 | \$3,000 | \$1,750 | \$2,400 | \$10,000 |
| Programmatic | \$7,980 | \$6,630 | n/a | \$2,800 | \$17,400 |
| ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION (ADDITIVE WITH BASELINE COSTS ABOVE OF CONSIDERING JEOPARDY) | | | | | |
| Technical Assistance | \$135 | n/a | \$263 | n/a | \$375 |
| Informal | \$588 | \$750 | \$513 | \$500 | \$2,380 |
| Formal | \$1,330 | \$1,500 | \$875 | \$1,200 | \$5,000 |
| Programmatic | \$3,990 | \$3,310 | n/a | \$1,400 | \$8,700 |
| Source: IEC analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2008, and a review of consultation records from several Service field offices across the country conducted in 2002. | | | | | |
| Notes: | | | | | |
| 1. Totals may not sum due to rounding. | | | | | |
| 2. Estimates reflect average hourly time required by staff. | | | | | |

Indirect Impacts

62. The designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 under the Act. Indirect impacts are those unintended changes in economic behavior that may occur outside of the Act, through other Federal, State, or local actions, and that are caused by the designation of critical habitat. This section identifies common types of indirect impacts that may be associated with the designation of critical habitat. Importantly, these types of impacts are not always considered incremental. In the case that these types of conservation efforts and economic effects are expected to occur regardless of critical habitat designation, they are appropriately considered baseline impacts in this analysis.

Habitat Conservation Plans

63. Under section 10 of the Act, an entity (i.e., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for a listed animal species in order to meet the conditions for issuance of an incidental take permit in connection with the development and management of a property.³⁰ While HCPs are not developed solely for plant species, if listed plants occur in the area subject to the HCP, the Service must consider whether the proposed activities may adversely affect or jeopardize the continued existence of the plant species. As such, the purpose of the habitat conservation planning process is to ensure that the effects of incidental take are adequately avoided or minimized. Thus, HCPs are developed to ensure compliance with section 9 of the Act and to meet the requirements of section 10 of the Act.
64. Application for an incidental take permit and completion of an HCP are not required or necessarily recommended by a critical habitat designation. However, in certain situations the new information provided by the proposed critical habitat rule may prompt a landowner to apply for an incidental take permit. For example, a landowner may have been previously unaware of the potential presence of the species on his or her property, and expeditious completion of an HCP may offer the landowner regulatory relief in the form of exclusion from the final critical habitat designation. In this case, the effort involved in creating the HCP and undertaking associated conservation actions are considered an incremental effect of designation.

Other State and Local Laws

65. Under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation.

³⁰ U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning." From: <http://endangered.fws.gov/hcp/>, as viewed on August 6, 2002. While HCPs are not typically developed specifically for listed plant species, an HCP may include listed or non-listed plant species that may be affected by the project subject to the HCP.

66. CEQA, for example, requires that lead agencies, public agencies responsible for project approval, consider the environmental effects of proposed projects that are considered discretionary in nature and not categorically or statutorily exempt. In some instances, critical habitat designation may trigger CEQA-related requirements. This is most likely to occur in areas where the critical habitat designation provides clearer information on the importance of particular areas as habitat for a listed species. In addition, applicants who were “categorically exempt” from preparing an EIR under CEQA may no longer be exempt once critical habitat is designated. In cases where the designation triggers the CEQA significance test or results in a reduction of categorically exempt activities, associated impacts are considered to be an indirect, incremental effect of the designation.

Additional Indirect Impacts

67. In addition to the indirect effects of compliance with other laws or triggered by the designation, project proponents, land managers and landowners may face additional indirect impacts, including the following:
- **Time Delays** - Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to reinitiate the section 7 consultation process and/or compliance with other laws triggered by the designation. To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation.
 - **Regulatory Uncertainty** - The Service conducts each section 7 consultation on a case-by-case basis and issues a biological opinion on formal consultations based on species-specific and site-specific information. As a result, government agencies and affiliated private parties who consult with the Service under section 7 may face uncertainty concerning whether project modifications will be recommended by the Service and what the nature of these modifications will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. Where information suggests that this type of regulatory uncertainty stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation. In this specific analysis, information is not available to quantify this effect.
 - **Stigma** - In some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated project modifications and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. All else equal, a property that is designated as critical habitat may have a lower market value than an identical property that is not within the boundaries of critical habitat due to perceived limitations or restrictions. As the public becomes aware of the true regulatory burden imposed by critical habitat, the impact of the designation on property markets may decrease. To the extent that potential stigma effects on markets are

probable and identifiable, these impacts are considered indirect, incremental impacts of the designation. Data limitations prevent the quantification of stigma effects resulting from thistle conservation efforts.

2.3.3 BENEFITS

68. Under E.O. 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.³¹ 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.³²
69. In the context of critical habitat, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing E.O. 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.³³ *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.*
70. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements (PCEs) on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.
71. 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 habitat preserves are created to protect a species, the value of existing residential property adjacent to those preserves may increase, resulting in a measurable positive impact. Where data are available, this analysis attempts to capture the *net* economic impact (i.e., the increased regulatory

³¹ E.O. 12866, Regulatory Planning and Review, September 30, 1993.

³² 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>.

³³ Ibid.

burden less any discernable offsetting market gains), of species conservation efforts imposed on regulated entities and the regional economy.

2.3.4 GEOGRAPHIC SCOPE OF THE ANALYSIS

72. The geographic scope of the analysis includes all land identified as critical habitat. Note that economic activities affecting critical habitat may be sited outside of the boundaries of the study area (e.g., upstream activities); these activities are considered relevant to this analysis. The study area does not include lands previously designated as critical habitat that are not included in this proposed revision.
73. Results are presented by proposed critical habitat unit in most tables. Where significant impacts result from specific parcels within units, these parcels and the associated costs are identified in the text and summary tables included in the Executive Summary.

2.3.5 ANALYTIC TIME FRAME

74. 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. The analysis estimates economic impacts to activities from 2000 (year of the species' final listing) to 2028 (20 years from the expected year of final critical habitat designation). Estimated impacts are divided into pre-designation (2000 - 2008) and post-designation (2009-2028) impacts.³⁴

2.4 INFORMATION SOURCES

75. The primary sources of information for this report are communications with, and data provided by, personnel from the Service, Federal, State, and local governments and other stakeholders. In addition, this analysis relies upon the Service's section 7 consultation records and draft management plans prepared by various government agencies. Due to the high number of entities contacted, the complete list of contacted stakeholders is located within the reference section at the end of this document.

³⁴ As described in the Proposed Rule, the Service first designated critical habitat for this species in 2004 (69 FR 12553). "Pre-designation" and "post-designation" in this report refer to the revised final critical habitat designation expected in 2009.

CHAPTER 3 | BASELINE REGULATIONS

76. The conservation and protection of endangered species takes place at multiple levels in the State of California, under a complex web of regulation and permitting processes designed to protect sensitive species and their habitat. Specifically, the thistle receives protection under the California Endangered Species Act, the California Environmental Quality Act, and, at the Federal level, under the Endangered Species Act. Layered over this regulatory framework are geographically specific factors which also contribute to treatment of thistle and its critical habitat. The proposed habitat is home to several other listed species and designated critical habitat, which has important implications for the impact of this proposed rule on economic activities in these areas. A brief overview of these regulations and the potential impacts on conservation of the thistle are provided below.

3.1 CALIFORNIA ENDANGERED SPECIES ACT

77. CESA essentially parallels the main provisions of the federal Act and is administered by the California Department of Fish and Game (CDFG). Under CESA, “endangered species” are defined as a species of plant, fish, or wildlife which is “in serious danger of becoming extinct throughout all, or a significant portion of its range” and are limited to species or subspecies native to California.³⁵ The thistle is currently listed as “threatened” under CESA.

78. Although generally similar, the State and Federal endangered species laws are distinct with regard to their treatment of listed plant species. Section 9 of the federal Act prohibits the “take” of endangered species of fish or wildlife. “Take” of plants is not specifically prohibited, however Section 9 prohibits the knowing violation of any law or regulation of any State.³⁶ CESA, on the other hand, prohibits the “take” of listed plant species, providing some additional weight to section 9 of the federal Act. The primary impact of this divergence is that consideration of the thistle is often concentrated at the State and local level, in conjunction with the CEQA process, as discussed below.

³⁵ California Wetlands Information System, CESA summary. As viewed November 17, 2008:
http://ceres.ca.gov/wetlands/permitting/cesa_summary.html

³⁶ 16 USC 1538.

3.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT³⁷

79. CEQA requires State and local agencies (known as “lead agencies”) to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. Projects carried out by Federal agencies are not subject to CEQA provisions. CEQA regulations require a lead agency to initially presume that a project will result in a potentially significant adverse environmental impact and to prepare an EIR if the project may produce certain types of impacts³⁸, including when

[t]he project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of major periods of California history or prehistory.³⁹

80. State law instructs the lead agency (typically a county or city planning agency in the case of land development projects) to examine impacts from a very broad perspective, taking into account the value of animal and plant habitats to be modified by the project. The lead agency must determine which, if any, project impacts are potentially significant and, for any such impacts identified, whether feasible mitigation measures or feasible alternatives will reduce the impacts to a level less than significant. It is within the power of the lead agency to approve a project with significant negative impacts if the agency concludes that those impacts are acceptable in light of economic, social, or other benefits generated by the project.
81. Projects without a mandatory finding of significance and that the lead agency concludes will not result in significant impacts may be approved by a lead agency in what is known as “negative declaration.” Alternative project scenarios are not examined for projects approved by negative declaration, and the expenditures are typically much lower than what would be required to complete an EIR.
82. Alternatively, an applicant may request that a lead agency issue a permit or some other discretionary approval for a project that is redesigned to either avoid or mitigate all significant impacts to the environment. Typically, the project is then approved by the lead agency through what is known as a “mitigated negative declaration.” Similar to a negative declaration, the expenditures required for approval of a project with a mitigated negative declaration are on average, much lower than costs associated with a project that requires preparation of an EIR.

³⁷ The text in this section is taken primarily from Economic and Planning Systems, “Economic Analysis of Critical Habitat Designation for CTS, Santa Barbara County,” prepared for the U.S. Fish and Wildlife Service, August 26, 2004.

³⁸ Categories of “environmental impact” evaluated in the context of CEQA review and/or EIR preparation typically include geological, air quality, water quality, noise, light/glare, land use planning, population, housing, transportation/circulation, public service, utility system, energy, human health, aesthetic, recreational, and cultural resource impacts.

³⁹ California Natural Resources Code §15065(a).

83. Finally, minor projects that fit one of eleven classifications as defined by the CEQA statutes may be found to have no significant effect on the environment. Some of these classifications are listed here.
- Certain alterations of existing facilities;
 - Replacement or reconstruction of existing structures;
 - Development projects such as restaurants smaller than 2,500 square feet;
 - Certain projects involving landscaping or temporary trenching;
 - Lot line adjustments;
 - Experimental management or research;
 - Habitat restoration;
 - Certain safety inspections or mortgage lending; and
 - Signs and small parking lots.
84. Many of these types of minor projects are eligible for a “categorical exemption” from the provisions of CEQA altogether, and compliance costs are usually limited to completion of the paperwork required by the lead agency.
85. Generally, most large real estate development projects that are responsible for housing and industrial and commercial construction in California counties are required under CEQA to submit an EIR for public review and consider project alternatives. A lower level of CEQA review, perhaps taking the route of a negative declaration, for example, is highly unlikely for such large-scale projects. Preparation of an EIR for any such development project will include formal consideration of all potential environmental impacts, including biological and/or habitat-related impacts, irrespective of the presence of designated critical habitat.
86. For smaller development projects, the presence of designated critical habitat may disqualify certain types of projects from claiming a categorical exemption, requiring the preparation of an EIR. Furthermore, projects that would have submitted a mitigated negative declaration or a negative declaration absent critical habitat are also likely to need an EIR in the presence of designated habitat. In both cases, additional administrative expense and delay are incurred, and modifications to the projects are possible. Finally, in Santa Barbara County, if a federally-listed species or its designated critical habitat are present, county representatives request a letter of concurrence from the Service prior to concluding the CEQA process.⁴⁰
- 3.3 OVERLAP WITH OTHER LISTED SPECIES**
87. The proposed critical habitat for thistle overlaps with several other listed species and their habitats, including, but not limited to, California tiger salamander, California red-legged frog, and Lompoc yerba santa. This overlap can affect the determination of whether

⁴⁰ Personal communication, D. Swenk and L. Tamura, Urban Planning Concepts, October 30, 2008.

impacts to activities within the proposed critical habitat are incremental. In areas where other endangered species and/or their critical habitat exist, any projects that have the potential to impact these species will already be subject to CEQA review and section 7 consultation. Combined with the fact that the federal Act does not prohibit take of plants, this means that the incremental impacts of the proposed designation are likely to be smaller than they would if the area did not overlap with other listed species.

88. In terms of federal involvement, the net effect of the presence of other listed species in the proposed thistle habitat is that consultations are likely to take into consideration multiple species. Indeed, the entire consultation history for thistle includes at least one other species in each biological opinion. In terms of the analysis, this means that the cost of consultation is not fully attributable to the presence of this species or its habitat. Nonetheless, because consultations must consider each species separately, a certain amount of research time will be spent on the thistle regardless of the presence of other species. Therefore this analysis conservatively includes the full cost of consultations including the thistle, regardless of the number of species considered.

3.4 PUBLIC AWARENESS OF THE THISTLE AND ITS CRITICAL HABITAT

89. Discussions with stakeholders indicate that there may be a lack of awareness of the potential presence of the thistle and the extent of its currently designated critical habitat. Specifically, critical habitat was first proposed for the thistle in 2001 as part of a joint rule with two other plant species, the Gaviota tarplant and the Lompoc yerba santa. The final rule for the other species was published in 2002, however the rule finalizing critical habitat for the thistle was not published until 2004.⁴¹ Interviews with landowners or managers in Units 1, 2, and 3 revealed that these individuals were not aware of the geographic extent of the current critical habitat.⁴² As shown in Exhibit 3-1, there is significant overlap between the current and revised proposed critical habitat. Furthermore, local planning consultants describing the CEQA process suggested that biologists hired to survey potentially developable properties for sensitive environmental resources currently do not look for the thistle; despite having submitted a public comment on the current proposed revised critical habitat rule, these consultants were also surprised to learn that designated critical habitat already exists in areas overlapping Unit 2.⁴³
90. This information gap may be attributed to a number of factors, including but not limited to: a lack of survey data on the presence of the thistle; the unusually prolonged period between the initial proposal for critical habitat (2001) and the final designation (2004); the fact that much of the proposed designation is considered unoccupied; the absence of a completed and publicly available Recovery Plan for the species; or even the rarity of the species, which is endemic to a small area of the California coast. Regardless of the

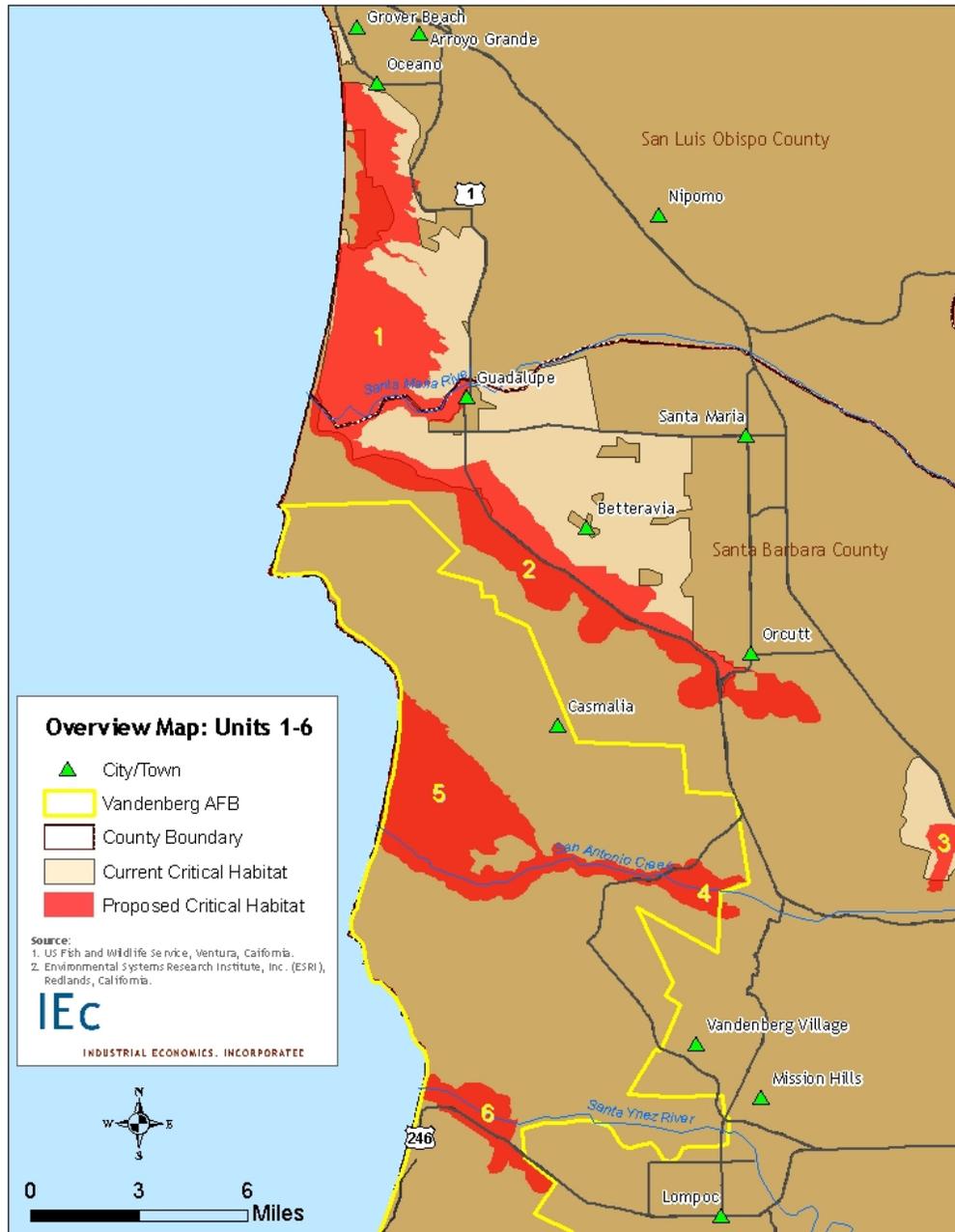
⁴¹ 2002 Final Rule, 67 FR 67967 and 2004 Final Rule, 69 FR 12553.

⁴² Based on personal communication on various occasions with the following: Refuge Manager, Guadalupe-Nipomo Wildlife Refuge (Unit 1), Breitburn Energy LLC. (Unit 2), and Four Deer, LLC (Unit 3).

⁴³ Personal communication, D. Swenk and L. Tamura, Urban Planning Concepts, October 30, 2008.

reason, the current proposal represents new information that will be integrated into the decision-making process by landowners and regulators that could result in incremental impacts.

EXHIBIT 3-1 MAP OF CURRENT AND PROPOSED CRITICAL HABITAT FOR LA GRACIOSA THISTLE



CHAPTER 4 | VANDENBERG AIR FORCE BASE

91. This chapter discusses management activities undertaken by Vandenberg Air Force Base for the protection of the thistle and its habitat. The main expenditure associated with this species is the cost of plant and habitat surveys in support of general species conservation goals. Other activities that benefit the thistle include invasive species management and biological assessments prior to commencement of projects on the base. Information presented in this chapter was provided directly by Vandenberg personnel or outlined in the draft Endangered Species Management Plan (ESMP) for La Graciosa Thistle. The ESMP is a document developed in coordination with the Service outlining management actions for the thistle and its habitat. Ultimately, the ESMP will be incorporated into the final INRMP. A Programmatic Biological Assessment addressing multiple endangered species is also under development. Total costs for conservation of the thistle are summarized in Exhibit 4-1 and discussed in depth in the proceeding sections.

**EXHIBIT 4-1 SUMMARY OF COSTS ASSOCIATED WITH THISTLE CONSERVATION
(2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)**

| UNIT | PRESENT VALUE IMPACTS | |
|---|-----------------------|------------------|
| | LOW ESTIMATE | HIGH ESTIMATE |
| Pre-Designation Impacts (2000 - 2008) | | |
| 4: San Antonio Creek | \$42,800 | \$63,700 |
| 5: San Antonio Terrace Dunes | \$72,500 | \$108,000 |
| 6: Santa Ynez River | \$24,500 | \$36,500 |
| Total | \$140,000 | \$208,000 |
| Post-Designation Impacts (2009 - 2028) | | |
| 4: San Antonio Creek | \$22,900 | \$44,500 |
| 5: San Antonio Terrace Dunes | \$38,800 | \$75,300 |
| 6: Santa Ynez River | \$13,100 | \$25,500 |
| Total | \$74,900 | \$145,000 |
| Post-Designation Incremental Impacts (2009 - 2028) | | |
| 4: San Antonio Creek | \$0 | \$0 |
| 5: San Antonio Terrace Dunes | \$0 | \$0 |
| 6: Santa Ynez River | \$0 | \$0 |
| Total | \$0 | \$0 |
| Note: Totals may not sum due to rounding. | | |

4.1 INTRODUCTION

92. Vandenberg Air Force Base encompasses nearly 100,000 acres along 42 miles of coastline in Santa Barbara County, California. Situated in a transitional zone between the south and central coast, this expansive area includes a wide range of unique habitats and is home to multiple endangered or threatened species. Vandenberg Air Force Base spans Units 4, 5, and 6, and the Air Force is the primary landowner in these units, with the exception of approximately 281 acres which are privately held and 38 acres of county or local government land.⁴⁴ Mission-critical activities on the base include missile and satellite launches; it is the only Department of Defense facility authorized to conduct missile launches. Due to the potentially hazardous nature of these activities, much of the land on the base is zoned for open space, although some grazing and agriculture is permitted. Natural resources are managed under the draft INRMP which is currently being revised.⁴⁵

4.2 INRMP (2003-2008)

93. Vandenberg Air Force Base's INRMP is a comprehensive ecosystem-based approach to land and resource management. The document addresses environmental and natural resource concerns, ranging from fish and wildlife management to recreation and agriculture. Endangered and threatened species are given special attention and management consideration, although no specific activities for the thistle are included in the existing INRMP, since the last confirmed sighting of the thistle on the base occurred in 1958 and the plant has not been identified in subsequent surveys.⁴⁶ Vandenberg is currently in the process of revising the INRMP, as the plan period ended in 2008.

94. Under the provisions of the 2004 National Defense Authorization Act, military installations may be exempt from critical habitat designation if an INRMP is in place that meets certain requirements.⁴⁷ Since the revisions to the INRMP are not yet finalized, the management activities for the thistle and other potential impacts of the proposed designation are still considered in this analysis.

Endangered Species Management Plan for La Graciosa thistle (2008)

95. During the public comment period on the proposed revision to thistle critical habitat, Vandenberg submitted a draft ESMP for this species as an attachment to its official comments. This plan will be implemented while the revisions to the INRMP are finalized; it is expected that all elements of the ESMP will be incorporated into the final INRMP Threatened and Endangered Species Management Plan.⁴⁸

⁴⁴ 2008 Proposed Rule, 73 FR 45818.

⁴⁵ Note that Vandenberg Air Force Base completed an INRMP in 2003 but it was never approved by the Service.

⁴⁶ SRS Technologies, 2003. INRMP, p. 8-19.

⁴⁷ "National Defense Authorization Act of 2004" (108-136), Section 318, p. 1433.

⁴⁸ Draft ESMP for La Graciosa thistle. Submitted Public Comments September 29, 2008. Attachment # 2, Document # FWS-R8-ES-2008-0078-0007.3

96. According to the ESMP, the main threats to the thistle's survival on the base are watershed-alteration and habitat degradation through various means, including development, agriculture, and invasive species.⁴⁹ Currently, the Base is not considered occupied by the thistle and therefore no actions have been taken to protect the thistle to date. In the ESMP, the Air Force proposes to prohibit development that is not mission-critical, in areas where the thistle is found. Mission-essential development would still be allowed in these areas and acceptable habitat outside of this development would be identified in conjunction with the Service and protected accordingly.
97. The ESMP also has provisions for maintenance activities which occur in suitable thistle habitat. In general, measures will be taken to avoid impacts by restricting work to previously disturbed areas, or by moving the project to avoid habitat, whenever possible. Measures taken to fulfill these objectives may include: project redesign or relocation to avoid sensitive areas, use of low-impact equipment, fencing around sensitive zones, and biological monitors during construction. Because information regarding the characteristics of likely future projects is unavailable, associated costs cannot be estimated at this time.⁵⁰
98. Vandenberg Air Force Base plans to address invasive species through a series of management actions focused on specific non-native plants that threaten the thistle's existence.⁵¹ Vegetation management includes training of personnel, limiting heavy equipment use in sensitive areas, and chemical and mechanical weed treatment. These activities will be conducted holistically for general ecosystem management, thereby benefitting multiple species. Due to this emphasis on ecosystem-level management, it is not possible to specify costs for the thistle alone and overall program cost information cannot be provided by Vandenberg Air Force Base.^{52, 53}

⁴⁹ Draft ESMP for La Graciosa thistle. Submitted Public Comments September 29, 2008. Attachment # 2, Document # FWS-R8-ES-2008-0078-0007.3.

⁵⁰ Cost information for the INRMP is not available because the report is a public document and any information contained within is subject to FOIA, which would pose conflicts with potential contractors conducting work proposed under the plan (Written and verbal communication, L. Lum, Botanist, Vandenberg Air Force Base, November 11 and 12, 2008).

⁵¹ Draft ESMP for La Graciosa thistle. Submitted Public Comments, September 29, 2008. Attachment # 2, Document # FWS-R8-ES-2008-0078-0007.3.

⁵² Personal communication, Vandenberg Air Force Base personnel, September 24, 2008.

⁵³ Cost information for the INRMP is not available because the report is a public document and any information contained within is subject to FOIA, which would pose conflicts with potential contractors conducting work proposed under the plan (Written and verbal communication, L. Lum, Botanist, Vandenberg Air Force Base, November 11 and 12, 2008).

Current and ongoing management activities for La Graciosa thistle

99. While no projects have been limited specifically due to the presence of the thistle, prior to any maintenance or construction activities on the base, sensitive habitats and species are considered. The level of effort varies greatly by project, but generally, a biological survey of the project site is conducted which includes all sensitive species known to exist on the base.⁵⁴ Anywhere from zero to five projects usually occur each year and the biological assessments required prior to project initiation usually range from one day to a week in duration.⁵⁵ This analysis assumes an average of 2.5 projects per year, with a low estimate of one day and a high estimate of one week required to conduct the assessment. This results in projected impacts between \$13,000 and \$65,000, undiscounted, during the time period of this analysis.⁵⁶ These activities would be conducted regardless of the designation of critical habitat and are therefore considered to be baseline expenditures. Because these surveys include all endangered species and sensitive resources, these values likely overestimate the cost directly attributable to the thistle.
100. In addition to considering the thistle and its habitat during biological assessments, the Air Force conducts monitoring as part of its overarching goal of endangered species preservation. Management for the thistle's preservation includes surveys for the plant in identified habitat areas, as well as in high-priority suitable habitat.⁵⁷ Monitoring for the thistle and its habitat is conducted approximately every four years at a cost of \$24,000 per survey.⁵⁸ These costs are considered baseline because they result from activities are ongoing and will continue in the future, regardless of critical habitat designation. Other activities include GIS mapping, identification of habitat in lower priority areas, and annual review of the status of the species.⁵⁹

Programmatic Biological Assessment and Biological Opinion (2008)

101. As part of the INRMP process, Vandenberg Air Force Base is currently developing a Programmatic Biological Assessment (PBA) and Basewide Biological Opinion. This PBA is intended to reduce the administrative burden on the Air Force and the Service related to on-going section 7 consultation on regular activities occurring at Vandenberg Air Force Base.⁶⁰ This assessment considers endangered and threatened species on the base and provides an adaptive management plan for their conservation in relation to base

⁵⁴ Personal communication, L. Lum, Botanist, Vandenberg Air Force Base, November 12, 2008.

⁵⁵ This is generally true, with the exception of one project which lasted several weeks. (Written communication, L. Lum, Botanist, Vandenberg Air Force Base, November 18, 2008).

⁵⁶ This estimate is based on GS-Level 11 (Ibid.)

⁵⁷ Draft ESMP for La Graciosa thistle. Submitted Public Comments, September 29, 2008. Attachment # 2, Document # FWS-R8-ES-2008-0078-0007.3.

⁵⁸ Personal communication, L. Lum, Botanist, Vandenberg Air Force Base, November 12, 2008.

⁵⁹ Written communication, L Lum, Botanist, Vandenberg Air Force Base, November 11, 2008.

⁶⁰ Personal communication, N. Huber, Ventura Fish and Wildlife Office (FWO), November 12, 2008.

operations. The base is home to 15 other listed species besides the thistle but no critical habitat is currently designated for any species.⁶¹

102. At this time, it is unclear whether the thistle will be included in the PBA; therefore this analysis conservatively assumes that the thistle will be included, and incorporates the total administrative cost of approximately \$26,000, to be incurred in 2008 as a pre-designation cost. This value likely overestimates the cost directly attributable to the thistle given that the PBA includes several other species.
103. The Air Force submitted the basewide programmatic biological assessment to the Service in July 2008 and plans to request initiation of formal section 7 consultation by the end of 2008.⁶² It is unlikely that the assessment will be approved prior to the final designation of critical habitat for the thistle.⁶³ Therefore, project modifications and associated costs cannot be estimated at this time.⁶⁴ In addition, while consultations for other species have been ongoing between Vandenberg and the Service, there is no consultation history for the thistle with which to predict future actions required by the Service.⁶⁵
104. Consultations have not been sought for consideration of the thistle because it is not currently present on the base; however, if critical habitat is designated as proposed, Vandenberg Air Force Base may need to consult with the Service for activities that could adversely impact critical habitat, particularly if the thistle is not included in the PBA.⁶⁶ The cost of considering thistle habitat in consultation is therefore considered to be incremental, as will any additional measures the Service requires for protection of the thistle's habitat.
105. In its public comment letter on the proposed rule, representatives of Vandenberg Air Force Base state that, in addition to section 7 consultation costs, the presence of critical habitat could require Vandenberg Air Force Base to undertake additional effort under the National Environmental Policy Act (NEPA). Specifically, projects which formerly required only an environmental assessment (EA) may now require an environmental impact statement (EIS). The comment letter states that while the costs of a typical EA at Vandenberg Air Force Base range from \$50,000 to \$100,000, the costs of an EIS may be as great as \$1 million.⁶⁷ Absent information about the number and characteristics of the projects requiring an EA or EIS in the future, total impacts cannot be estimated at this time.

⁶¹ Personal communication, Vandenberg Air Force Base personnel, September 24, 2008.

⁶² Written communication, L. Lum, Botanist, Vandenberg Air Force Base, November 11, 2008.

⁶³ Personal communication, N. Huber, Ventura FWO, November 12, 2008.

⁶⁴ Programmatic Biological Assessment: Effects of Activities Conducted at Vandenberg Air Force Base, California, on 14 Federally Threatened and Endangered Species. Submitted to the Service November 18, 2008.

⁶⁵ Ibid.

⁶⁶ Ibid.

⁶⁷ USAF Comments. Submitted Public Comments, September 29, 2008. Attachment # 1. Document # FWS-R8-ES-2008-0078-0007.2.

4.3 AGRICULTURE AND GRAZING

106. Agriculture occurs on Vandenberg Air Force Base lands within proposed Units 4 and 6 and there is some grazing in Unit 6. These activities do not overlap with the PCEs for the thistle, although they are closely adjacent to these areas.⁶⁸ Agriculture on the base consists primarily of dry cropping; there are some irrigated fields outside and upstream of Units 4 and 6, which could potentially impact the quality of thistle habitat if water resources are affected.⁶⁹ However, due to the limited extent of agriculture on the base and the inability of the Air Force to control activities outside of the base, no alterations to these activities are expected.
107. Vandenberg Air Force Base is currently considering a change in the timing and duration of grazing allowed on the base in support of general resource management goals and for the protection of other endangered species. These changes would occur regardless of the designation of critical habitat for the thistle and are therefore not considered in this analysis.

⁶⁸ Personal communication, L. Lum, Botanist, Vandenberg Air Force Base, November 12, 2008.

⁶⁹ 2008 Proposed Rule, 73 FR 45816 and Draft ESMP for La Graciosa Thistle, Section 3.3.

CHAPTER 5 | RECREATION

108. This chapter considers potential economic impacts to recreation activities resulting from thistle conservation efforts. The analysis assumes that the only recreation activity that may be affected is off-highway vehicle use at the Oceano Dunes State Vehicular Recreation Area (ODSVRA). The CDPR, which manages ODSVRA, is in the process of preparing a multi-species HCP for certain State park lands in San Luis Obispo County including the ODSVRA, and the plan will address management of thistle critical habitat. It does not appear likely that the HCP will be completed by the time the critical habitat designation is finalized, and the likely management measures to be implemented in the OHV riding areas are uncertain.
109. Future management decisions concerning the thistle may lead to closure of portions of the riding area, limitations on the number of OHV users allowed within a given area, or may not limit OHV use at all. It is not possible, using existing data, to predict what the nature or scope of such restrictions would be. In addition, future management of a portion of ODSVRA, known as La Grande Tract, is uncertain. Specifically, this area may or may not continue to be operated as part of the park. Due to the lack of a site-specific model of visitor behavior in response to potential closures, a bounding analysis is presented.
- In the lower-bound scenario, OHV use in ODSVRA continues unimpeded. This scenario represents several potential outcomes, including: no change to the riding area at ODSVRA; visitation is not affected by any potential closures; or OHV recreators are able to substitute to other areas without a loss in consumer surplus or a change in spending patterns.
 - In the upper-bound scenario, La Grande Tract is closed to OHV use in the baseline and an additional five percent of the riding area is closed due to critical habitat designation for the thistle. This scenario reflects the assumption that some people who would have made a trip to ODSVRA for OHV recreation will choose not to due to the closures. Any future action short of closure of La Grande Tract and an additional five percent of the riding area, or any scenario in which visitors respond to closures in a manner other than taking fewer trips to ODSVRA, would generate an impact between these two bounds.
110. Impacts to OHV use are manifested in economic efficiency effects (i.e., social welfare) and distributional effects (i.e., regional impacts), as outlined below.
- ***Efficiency effects due to reduced OHV use:*** Due to the potential closure of portions of ODSVRA, OHV users may have reduced recreational opportunities. OHV users may incur economic efficiency losses associated with this loss of access. Economic efficiency losses are social welfare losses often measured by

changes in consumer surplus. Economic efficiency losses are calculated by estimating the number of lost OHV-related visits to ODSVRA multiplied by the consumer surplus value of an OHV visit.

- ***Distributional and regional economic impacts in OHV-related industries:*** Fewer OHV-related visits may result in reductions in OHV visit-related expenditures. These reduced expenditures are likely to affect income and employment in various OHV-related industries within San Luis Obispo County. Impacts to these industries may, in turn, result in indirect effects to the broader economy.

111. This chapter is divided into five sections: (1) summary of pre- and post-designation impacts; (2) background information on OHV use in ODSVRA; (3) methods and assumptions; (4) analysis of pre-designation impacts; and (5) analysis of post-designation impacts.

5.1 SUMMARY OF IMPACTS TO OHV USE

112. This section presents a brief summary of pre- and post-designation impacts; details of the underlying analysis and assumptions are included in the following sections. Note that, post-designation impacts are classified as either occurring in the baseline (i.e., regardless of whether critical habitat is designated for the thistle) or as incremental impacts that are likely to result from the designation.
113. Exhibit 5-1 summarizes pre- and post-designation impacts to OHV use. The range in estimated baseline and incremental impacts results from the bounding approach described briefly above and in detail in the sections that follow. The lower-bound scenario assumes that OHV use within the park is not affected, while the upper-bound scenario assumes closure of La Grande Tract in the baseline and closure of an additional five percent of the riding area resulting from critical habitat designation.

**EXHIBIT 5-1 SUMMARY OF IMPACTS TO ODSVRA
(2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)**

| UNIT | PRESENT VALUE IMPACTS | |
|--|--|---------------|
| | LOWER BOUND | UPPER BOUND |
| Pre-Designation Impacts (2000 - 2008) | | |
| 1: Callender-Guadalupe Dunes | HCP development and survey costs are unavailable at this time. | |
| Post-Designation Baseline Impacts (2009 - 2028) | | |
| 1: Callender-Guadalupe Dunes | \$14,000 | \$220,000,000 |
| Incremental Impacts (2009 - 2028) | | |
| 1: Callender-Guadalupe Dunes | \$40,900 | \$39,300,000 |

5.2 BACKGROUND INFORMATION ON OHV USE IN ODSVRA

5.2.1 DESCRIPTION OF RIDING AREA AND HISTORICAL VISITATION

114. ODSVRA is one of several OHV areas administered by the CDPR. The park has been classified as a State Vehicular Recreation Area since July 12, 1974 (at which point it was known as Pismo Dunes). In addition to OHV use, ODSVRA offers activities such as swimming, surfing, surf fishing, camping, and hiking.⁷⁰ ODSVRA encompasses roughly 3,400 acres in San Luis Obispo County; 1,654 acres are open to OHV use between March 1 and September 30 (western snowy plover nesting season) and 1,948 acres are open between October 1 and February 28.⁷¹ Proposed critical habitat Unit 1, Callender-Guadalupe Dunes, includes approximately 713 acres that fall within this riding area.⁷² Exhibit 5-2 depicts ODSVRA and the riding area within in park. In addition, Exhibit 5-2 shows the county-owned lands within ODSVRA. The large block of county-owned lands in the center of the map makes up the area known as La Grande Tract. La Grande Tract is currently operated by ODSVRA under an agreement with the county.
115. ODSVRA is unique because it is one of the few places in California where the public is allowed to legally drive and camp on a sandy beach. There is a clear and specific legislative mandate for CDPR and the Off-Highway Motor Vehicle Recreation (OHMVR) Division to provide statewide opportunities for OHV recreation.⁷³ In 2008 ODSVRA is projected to serve over 2.1 million visitors. During the summer months, on weekends, and around the holidays, ODSVRA operates at or near capacity.⁷⁴

⁷⁰ CDPR Off-Highway Motor Vehicle Recreation Division, 2008. Oceano Dunes State Vehicular Recreation Area. Accessed October 2008. http://ohv.parks.ca.gov/?page_id=1207

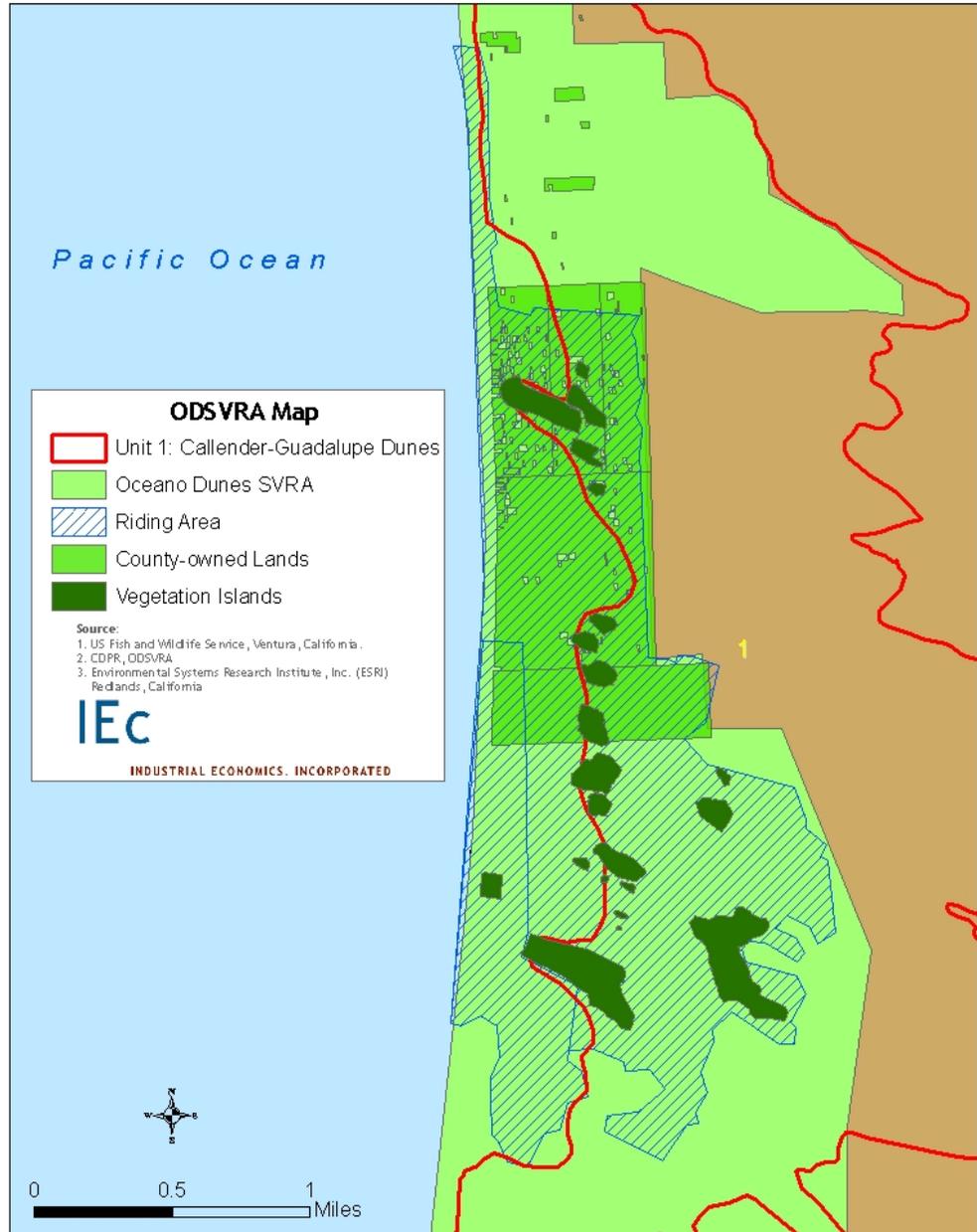
⁷¹ Written Communication. M. Elvin and C. Rutherford, Ventura Fish and Wildlife Office. December 17, 2008.

⁷² Ibid.

⁷³ CDPR, Off-Highway Motor Vehicle Recreation Division. Submitted Public Comments. September 17, 2008. Document # FWS-R8-ES-2008-0078-0006.1.

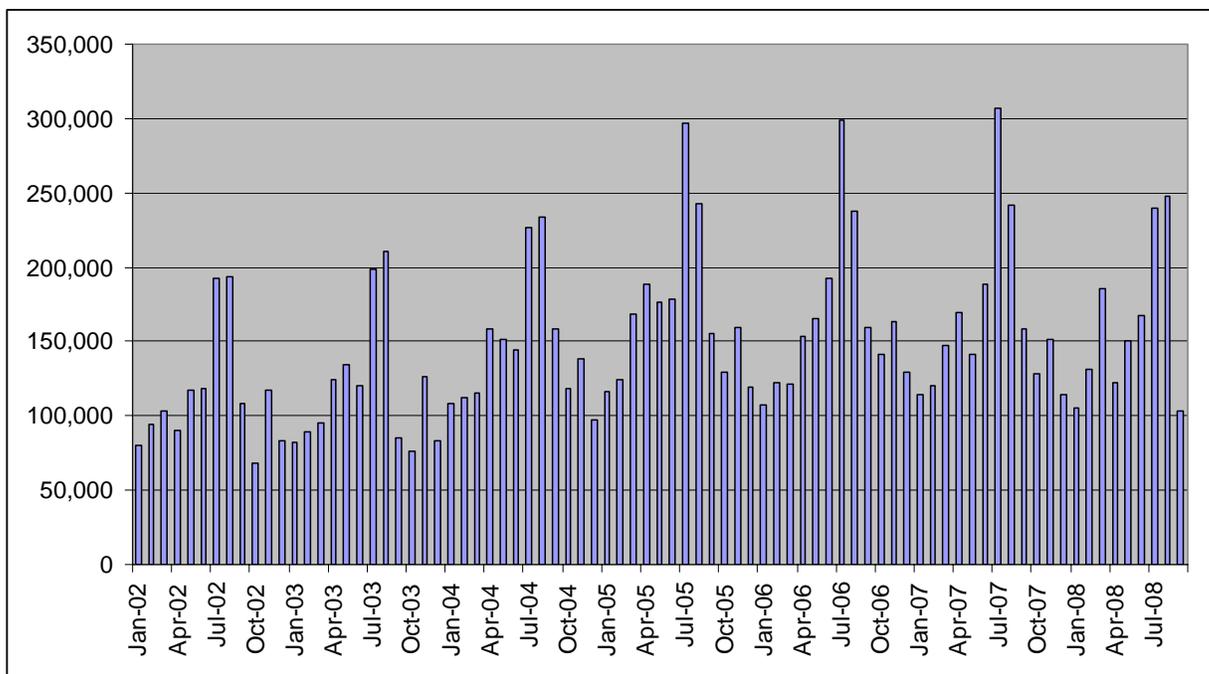
⁷⁴ Personal communication, A. Zilke and R. Glick, ODSVRA, October 10, 2008.

EXHIBIT 5-2 ODSVRA RIDING AREA WITHIN PROPOSED CRITICAL HABITAT UNIT 1



116. Exhibit 5-3 tracks ODSVRA visitation since 2002. Total attendance has held steady at around two million annually since 2005. The park feels that it has reached maximum capacity and expects visitation to remain around two million for the next 20 years.⁷⁵ The park does not explicitly keep data on OHV visitation within the SVRA, but estimates that 60 to 70 percent of park visitors are OHV users.⁷⁶

EXHIBIT 5-3 ODSVRA MONTHLY ATTENDANCE JANUARY 2002-SEPTEMBER 2008



Source: January 2002 - March 2005 data provided by Andrew Zilke, ODSVRA for western snowy plover analysis (2005); April 2005 - September 2008 data provided by Andrew Zilke, ODSVRA for this analysis (October 2008).

⁷⁵ Beginning in 2005, CDPR has erected exclosures along the beach at the ODSVRA to protect the federally-listed western snowy plover during its nesting season. These exclosures may prevent access to certain parts of the beach, resulting in lost trips by OHV users. In the 2005 draft economic analysis estimating the potential impacts of designating critical habitat for the plover at the ODSVRA, the analysis estimated that 66,588 OHV trips might be lost annually as a result of the exclosures (Industrial Economics, Incorporated, "Draft Economic Analysis of Critical Habitat Designation for the Western Snowy Plover," prepared for the U.S. Fish and Wildlife Service, July 20, 2005). These projected lost trips represent a small portion of overall park visitation (approximately three percent). Even with the fencing in place, annual visitation to ODSVRA was greater in 2005, 2006, and 2007 than in the pre-fencing years (2002-2004). Without an in-depth analysis it is impossible to infer from these data the reasons for the visitation increase. For example, visitation might have increased even more rapidly if there were no exclosures. Because the visitation data provided by the ODSVRA and presented in Exhibit 5-3 already incorporates these lost trips, reductions in visitation calculated in this report are incremental to impacts of current and future plover exclosures.

⁷⁶ Personal communication, A. Zilke and R. Glick, ODSVRA, October 10, 2008.

117. In a 2007 study by California Polytechnic State University – San Luis Obispo surveyed ODSVRA visitors from January 2005 through December 2005 and from January 2007 through April 2007 on randomly selected days. This study reveals that the vast majority of the park’s visitors reside in California (only four out-of-state subjects were recorded out of 407 subjects returning usable questionnaires). On average, visitors reside approximately 200 miles from the park and travel three and a half hours to get to the park.⁷⁷ Several OHV recreation areas exist in other parts of California and neighboring states that provide opportunities for OHV recreationists. Exhibit 5-4 describes ODSVRA substitute sites available for OHV recreation. Substitute sites were selected based on distance from ODSVRA and riding experience available. All sites within a 200-mile buffer of ODSVRA are considered reasonable substitutes.⁷⁸ It should be noted that the experience offered by these sites may not be a perfect substitute for an experience at ODSVRA, particularly since no other area offers a coastal dune riding experience.

EXHIBIT 5-4 SUBSTITUTE SITES AVAILABLE FOR OHV RECREATION

| OHV AREA | MANAGING AGENCY | APPROXIMATE DISTANCE FROM ODSVRA (MILES) |
|----------------------------|------------------|--|
| Los Padres National Forest | USFS | 47 |
| Clear Creek | BLM | 91 |
| Hungry Valley SVRA | California Parks | 102 |
| Hollister Hills SVRA | California Parks | 128 |
| Sequoia National Forest | USFS | 133 |
| Jawbone Canyon | BLM | 146 |
| Dove Springs | BLM | 149 |
| Sierra National Forest | USFS | 168 |
| El Mirage | BLM | 176 |
| Spangler | BLM | 178 |
| Carnegie SVRA | California Parks | 186 |
| Inyo National Forest | USFS | 197 |

118. OHV enthusiasts spend anywhere from \$10,000 up to \$80,000 on OHVs – purchasing sand buggies, quads, three wheelers, etc. Users also incur additional expenses on OHV related equipment, including RVs, tow vehicles, trailers, and supplies.⁷⁹ In 1993, the CDPR conducted a statewide study of OHV use. The study reported that households that purchased OHVs and related equipment in 1993 spent on average, \$2,219 on ATVs,

⁷⁷ Hendricks, W. W. et al., 2007. Economic Impact of Oceano Dunes SVRA Visitors. Report prepared for CDPR by California Polytechnic State University, San Luis Obispo.

⁷⁸ A 200-mile buffer was selected because on average visitors reside 200 miles from the park.

⁷⁹ Personal communication, C. Knauf and N. Hamada, BLM, October 17, 2003; American Sand Association, November 20, 2003; and Off Road Business Association, November 21, 2003.

\$5,018 on dune buggies, and \$11,980 on four-wheel drives, with an additional \$14,649 on tow vehicles and \$2,912 on trailers.⁸⁰

5.2.2 CURRENT ODSVRA MANAGEMENT

119. CDPR is currently developing a multiple species HCP covering six parks in San Luis Obispo County, including the ODSVRA. The HCP is intended to cover 14 species, including western snowy plover, California least tern, California red-legged frog, steelhead trout, tidewater goby, Morro shoulderband snail, and 10 plants including La Graciosa thistle.⁸¹ The current draft HCP covers OHV use, and it does not propose to limit these activities beyond installing nest enclosures for western snowy plover and California least tern, and enforcing speed limits on the beach.⁸²
120. According to representatives of CDPR, if the currently proposed critical habitat designation is finalized, the draft HCP must be revised to include consideration of the new critical habitat boundaries.⁸³ Because currently designated thistle critical habitat does not overlap the riding areas, the newly proposed designation is seen by CDPR as a significant change. The agency is concerned that because the designation boundaries have been redrawn to include a large portion of the riding area (713 of the 1,654 acres open March – September and 1,948 open October – February, or 43 and 37 percent respectively), the Service may request that driving be prohibited in critical habitat during its review of the HCP and associated section 7 consultation.⁸⁴
121. It is important to note that proposed critical habitat for the thistle is not the only factor potentially affecting future riding within the ODSVRA. The current riding area includes 584 acres of county-owned land known as La Grande Tract.⁸⁵ This land was being managed by the park under a 25-year operating agreement that expired in June 2008. Currently, the operating agreement has been extended on a month-to-month basis and the CDPR is in negotiations with the county to purchase this land, ensuring future availability for riding.⁸⁶

⁸⁰ California Department of State Parks and Recreation, Off-highway Motor Vehicle Recreation Division, 1993-1994. Off Highway Vehicle (OHV) Recreation's \$3 Billion Economic Impact in California & A Profile of OHV Users: A Family Affair. Accessed October 2008. <http://nohvcclibrary.forestry.uga.edu/hd%20econ%20ben.html>

⁸¹ Personal communication, A. Zilke and R. Glick, ODSVRA, September 11, 2008.

⁸² CDPR, Public Information Workshop, SLO Coast HCP Process, HCP Summary Information, as viewed at www.slostateparks.com/general_parks_info/hcp/HCP%20Summary%0Information_2_.pdf, on November 15, 2008.

⁸³ Personal communication, A. Zilke and R. Glick, ODSVRA, September 11, 2008.

⁸⁴ Public comment by A. Zilke on behalf of CDPR Off-Highway Motor Vehicle Recreation Division, September 17, 2008. Document # FWS-R8-ES-2008-0078-0006.1.

⁸⁵ GIS maps allowing for the calculation of the overlap between proposed critical habitat, the existing riding area, and the La Grande Tract were unavailable at the writing of this report.

⁸⁶ Charlton, A., 2008. SLO County extends agreement. *Santa Maria Times* 16 April 2008: Accessed November 2008. <http://www.santamariatimes.com/articles/2008/04/16/news/centralcoast/news04.prt>

122. Furthermore, CDPR has been sued by the Santa Lucia Chapter of the Sierra Club over allowing OHV use on La Grande Tract.⁸⁷ The basis of the Sierra Club's claim that OHV use should not be allowed within La Grande Tract is that use of these lands for riding is in violation of the County's Local Coastal Program (LCP).⁸⁸ Specifically, Figure 4 of the County's South County Coastal Planning Area Standards depicts La Grande Tract as a natural buffer area, where riding should not be allowed. The main argument of the case appears to be whether the LCP is considered local regulation, which can be preempted by state law, in particular Oceano Dunes General Development Plan that calls for riding in this area. The Endangered Species Act is briefly mentioned in the suit, with the Sierra Club claiming that the park is operating in violation of the Act because it does not have an HCP in place.⁸⁹ It is unclear if and how a judge may use this lawsuit to prevent OHV use within La Grande Tract.
123. Given uncertainty regarding the future of riding on the county-owned parcels, the analysis provides a bounding analysis of the baseline impacts. At the lower bound, La Grande Tract remains open to riding and visitation to the park will not be affected. At the upper bound, complete closure of La Grande Tract as part of ODSVRA occurs and visitation is affected in proportion to the amount of riding area that is closed. These scenarios will be described in greater detail in Section 5.3.

5.3 METHODS AND ASSUMPTIONS

124. For the reasons discussed in the previous section, future management of OHV riding in ODSVRA is highly uncertain. At a minimum, future costs will include completion of the HCP and the associated section 7 consultation with the Service. Incremental costs attributable to the rule include the administrative cost of revising the plan to consider thistle critical habitat and the cost of considering adverse modification in the associated section 7 consultation. In addition, if OHV use is precluded within parts of the riding area, OHV recreationists may experience welfare losses associated with the lost use of the areas, and the regional economy may suffer as a result of reduced spending by visitors.
125. In order to estimate the economic impact of potential reductions in OHV use in ODSVRA, the analysis applies the following steps:
1. **Estimate potential reduction in future OHV use at ODSVRA in the absence of designated critical habitat (baseline) and resulting from critical habitat designation (incremental).** In the absence of a site-specific model to understand visitor behavior, the analysis bounds reductions in future OHV use in the baseline and resulting from the critical habitat designation.

⁸⁷ *Sierra Club v. CDPR*. Superior Court for the State of California in and for the County of San Luis Obispo, Case No.: 080344.

⁸⁸ *Ibid.*

⁸⁹ *Sierra Club v. CDPR*. Superior Court for the State of California in and for the County of San Luis Obispo, Case No.: 080344, paragraph 22.

- **Baseline Impacts:** In the lower bound scenario, La Grade Tract continues in its current use as part of ODSVRA. In the upper bound scenario, complete closure of La Grade Tract to OHV use occurs.
- **Incremental Impacts:** If critical habitat is designated within the riding area, the Service believes that anywhere from zero to five percent of the riding area may be affected (i.e. closed to OHV use). At the lower bound, the analysis assumes that OHV use in ODSVRA is not affected by the designation of critical habitat within the park. At the upper bound, five percent of the riding area is assumed closed. Included within these bounds is the Service's "most likely impact" of 2.4 percent of the riding area.⁹⁰

The lower-bound scenario represents several potential outcomes: 1) no restrictions are placed on OHV use within the park; 2) visitation is not affected by any potential closures; and 3) OHV recreators are able to substitute to other areas without a loss in consumer surplus. The upper bound scenario assumes that some people who would have made a trip to ODSVRA for OHV recreation will choose not to due to the closure of portions of the riding area. This assumption relies on economic theory and studies that support the concept that closure of a portion of a recreation area is likely to result in fewer visits to that area.⁹¹ Any outcome short of complete closure of La Grande Tract and an additional five percent of the riding area or any scenario in which visitors respond to the potential closures in a manner other than taking fewer trips to ODSVRA would generate an impact between these bounds.

It should be noted that if La Grande Tract is closed in the baseline, then it is unlikely that an additional five percent of the riding area will be closed due to critical habitat designation. The Service has indicated that the figure of five percent was arrived at by joining the vegetation islands currently located within the riding area into larger vegetation islands.⁹² Many of these islands are located within La Grande Tract, so closure of La Grande Tract would eliminate the need for these areas to be closed due to critical habitat. Thus, considering the upper bounds of both the incremental and baseline scenarios together may overstate impacts. If La Grande Tract remains open to riding, then an upper bound of five percent of the riding area may be closed due to critical habitat designation.

2. **Calculate welfare effects resulting from potential lost OHV trips.** To estimate the welfare effects associated with potential lost OHV trips, the analysis applies a benefit transfer approach, as described in detail in Section 5.3.1. First, an appropriate consumer surplus value is identified based on existing literature. Next, the estimated number of lost vehicle trips is multiplied by the identified consumer surplus value.

⁹⁰ Written Communication. M. Elvin and C. Rutherford, Ventura Fish and Wildlife Office. December 17, 2008.

⁹¹ See Appendix B.

⁹² Personal Communication. M. Elvin and C. Rutherford, Ventura Fish and Wildlife Office. December 23, 2008.

3. **Calculate regional economic impacts resulting from these potential lost OHV trips.** To estimate regional economic impacts, the analysis relies heavily on the work of Hendricks et al. (2007).⁹³ Hendricks et al. collected expenditure data from ODSVRA visitors and then used the Impact Analysis for Planning (IMPLAN) model to translate estimates of trip expenditures into regional economic impacts. This study and its applications to the analysis are discussed in detail in Section 5.3.2.⁹⁴

5.3.1 WELFARE EFFECTS

126. To estimate welfare losses associated with potential lost OHV trips, the analysis uses a benefit transfer approach. Benefit transfer involves adapting existing research conducted to estimate economic values under one set of circumstances to address new policy questions. In this manner, existing valuation research is combined with site-specific data and information to develop a “transferred” estimate.
127. Because the conduct of an original study to estimate values for ODSVRA OHV trips is beyond the scope of this analysis, a benefit transfer approach is appropriate. Similarly, the proposed transfer conforms to guidelines elaborated in OMB Circular A-4 regarding Benefit-Transfer Methods.⁹⁵ For example, the OMB guidelines indicate that benefit transfer methods should not be used if:
- The study or policy resources are unique (e.g., values for Grand Canyon visits). In this case, substitute OHV sites with comparable attributes exist within the broader region.
 - There is disagreement in the valuation framework (e.g., *ex ante* vs. *ex post*) between the study and policy circumstances. In this case, both involve total consumer surplus values for OHV trips taken.
 - There is disagreement between the scale of changes being valued between the study and policy sites (e.g., marginal vs. non-marginal changes). In this case, both involve total consumer surplus values per-trip.
128. Benefit transfer has been widely applied in policy analysis and is approved for use within the DOI guidelines for natural resource damage assessment under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

⁹³ Hendricks, W. W. et al., 2007. Economic Impact of Oceano Dunes SVRA Visitors. Report prepared for CDPD by California Polytechnic State University, San Luis Obispo.

⁹⁴ The IMPLAN model is owned and maintained by the Minnesota IMPLAN Group, Inc. (MIG). For more information see: IMPLAN Professional, Social Accounting and Impact Analysis Software, User’s Guide, Analysis Guide, Data Guide, Minnesota IMPLAN Group, Inc.

⁹⁵ Office of Management and Budget, Circular A-4 re: Regulatory Analysis. September 17, 2003.

129. Best practice procedures for benefit transfer analyses are described in the OMB Circular A-4 on Regulatory Analysis mentioned above, and the U.S. EPA's *Guidelines for Preparing Economic Analyses*.⁹⁶ These authorities generally describe five key steps:
1. **Describe conditions to be valued:** Identify and describe in detail the valuation scenario, which in this case involves the nature and extent of OHV opportunities at ODSVRA and the manner in which management restrictions may affect future OHV use.
 2. **Identify relevant research:** Conduct a detailed search for relevant research.
 3. **Review research for quality and applicability:** Review relevant research carefully for quality and specific applicability. In particular, the candidate studies should employ established empirical methods and rely upon adequate data. In addition, the study and policy contexts should be similar with respect to the change being valued, the availability of substitutes, and demographic characteristics of the population.
 4. **Transfer of economic values:** Apply the valuation information identified to the conditions being valued. In particular, two principal strategies are available: benefit function transfer (transfer of an entire demand function) or point-estimate transfer (transfer of a single mean or median value estimate).
 5. **Address uncertainty:** Evaluate assumptions made in the process of transferring economic values and the sensitivity of the final estimate to such assumptions.
130. The first step involves describing the nature of OHV use in ODSVRA, probable use restrictions, and relevant research on the extent to which OHV visitation may be expected to decline. These aspects were addressed previously and are presented in Section 5.5.
131. To estimate the consumer surplus value of an OHV trip, the analysis obtained relevant studies from the resource economics literature. A substantive literature review on this subject was conducted for the economic analysis of critical habitat designation for the Peirson's milk-vetch. This research examined over 25 empirical studies related to impacts that may result from closures of portions of recreation areas. Two studies described in this review consider OHV recreation sites and thus seem the most applicable: Englin et al. (2003) and Jakus (2003).^{97, 98} Appendix B contains a copy of this literature review.

⁹⁶ U.S. Environmental Protection Agency (EPA), 2000. Office of the Administrator. Guidelines for Preparing Economic Analyses. EPA 240-R-00-003.

⁹⁷ Englin, J., T. Holmes, and R. Niell, 2003. Alternative Systems of Semi-Logarithmic Incomplete Demand Systems: Modeling Recreation Off-Highway Vehicle Site Demand. In *Benefits and Costs of Natural Resources Policies Affecting Public and Private Lands*, First Interim Report (pp. 150-164), J.S. Shonkwiler, ed. W-1133, Western Regional Research Publication.

⁹⁸ Jakus, P.M., 2003. Estimating the Economic Value of All-Terrain Vehicle Recreation in Utah. Final report in fulfillment of USU New Faculty Grant. September, 2003.

132. In this analysis of impacts resulting from thistle critical habitat, the primary assumption is that under closures, some OHV users who would otherwise recreate at ODSVRA would choose not to participate in this activity. Data do not exist to allow for development of a model of ODSVRA visitor behavior given closure of a portion of the riding area. For example, given closure of a portion of the riding area, users might simply substitute to other portions of the riding area, or to other OHV locations 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 this site, the analysis presents an upper-bound impact estimate, reflecting the loss in surplus that could result from reductions in OHV use due to the potential closure of portions of the riding area. As such, the surplus estimates used in the analysis reflect the total per day value of an OHV vehicle trip.
133. Two relevant studies were identified. First, Englin et al. (2003) estimate welfare values for OHV use at four recreational sites in western North Carolina. This study provides per-person OHV values that vary by recreational site ranging from approximately \$29 per trip to \$142 per trip (2008 dollars).⁹⁹ Using the average trip lengths from Englin et al. (1.5 to 2 days per trip) this works out to a per-person consumer surplus value of \$15 per day to \$95 per day. Second, Jakus (2003) estimates welfare values for OHV use in the State of Utah. This study reports that consumer surplus values per person range from approximately \$54 per day to \$63 per day (2008 dollars).
134. OHV users of ODSVRA are broadly similar to the all-terrain vehicle users in the two studies (Exhibit 5-5). In addition, both studies utilize well-established revealed-preference valuation techniques (e.g., travel-cost-based recreation demand models).

EXHIBIT 5-5 COMPARISON OF OHV LITERATURE SAMPLE CHARACTERISTICS AND ODSVRA USERS

| CHARACTERISTIC | ENGLIN ET AL. (2003) | JAKUS (2003) | ODSVRA USER |
|--|---|---|--|
| Location | North Carolina | Utah | California |
| Per-person consumer surplus per day (2008\$) | \$15-\$95 | \$54-\$63 | -- |
| Trip Length | 1.5 - 2 days per trip | 1 day | Stayed an average of 2.4 nights per trip |
| Average Visits per Year | 6 trips per year | 13.9 visits per year (69% of sample less than 10 visits per year) | Not available |
| OHV users per family | 2.78 | 2.7 | Not available |
| Vehicle Type | ATV, four-wheel drive, trail bike | ATV | ATV, four-wheel drive |
| Mean trip expenditure | \$454, ranges from \$270 - \$679 depending on site. | Not available | \$84 per visitor |
| Gender | 90 percent male | 61 percent male | 62 percent male |
| Average Age | 34 years old | 43 years old (median) | 38 years old |

⁹⁹ Value adjustment from 2003 to 2008 dollars made using GDP Deflator inflation calculator available at: <http://cost.jsc.nasa.gov/inflateGDP.html>, accessed October 2008

| | | | |
|---|-------------------|---------------|---|
| Education level | 13 years | Not available | 80% had some education beyond high school |
| Income | \$52,000 (median) | Not available | 51% had income less than \$80,000 |
| Source: Englin et al. (2003); Jakus (2003); Hendricks et al. (2007) | | | |

135. This analysis uses a per-person consumer surplus value of \$57 per day (2008 dollars) based on the average value from Englin et al. (2003) and Jakus (2003). A point-estimate benefit transfer using this value is performed because inadequate information is available to support a benefit-function transfer.
136. It is expected that the value of OHV use at ODSVRA would be at least that which was presented in these studies for a number of reasons. First, the per-trip, per-person value estimate likely underestimates the value of trips taken to ODSVRA given the special nature of this site as the only in California that allows the public to legally drive and camp on a sandy beach. The sites surveyed in the Englin et al. study are less unique than the sand dunes of California. The sites in Englin et al. reflect over 100 miles of forested areas available to all-terrain vehicles, dirt bikes, and four-wheel drive vehicles. In addition, the North Carolina OHV sites have several substitute opportunities that are in close proximity to each other, relative to the dune-based OHV sites in California.
137. To address uncertainty associated with value transfer from these two specific studies, the broader valuation literature on off-road driving activities was reviewed. This review indicated that other valuation studies of off-road driving activities estimate similar consumer surplus values. In particular, Rosenberger and Loomis (2000) provide a published summary of net economic values per recreation day for various types of recreation including “off-road driving.”¹⁰⁰ This study is an update of a previous national study of outdoor recreation values (Walsh et al., 1992).¹⁰¹ Their summary includes information from 131 outdoor recreation demand studies and provides value estimates for 21 different categories of benefits. The summarized studies use a variety of methodologies, including travel cost and contingent valuation methods. The authors estimate the average value for a day of off-road driving to be approximately \$37 per person (2003 dollars) on the Pacific Coast, and approximately \$22 per person (2003 dollars) nationally. Because these studies reflect off-road activities in a broad geographic area, the analysis assumes that these values represent average quality recreational resources. As such, we would expect these values to cover a range of estimates that are lower than the value of a day of OHV use at ODSVRA.

5.3.2 REGIONAL ECONOMIC IMPACTS

¹⁰⁰ Rosenberger, R.S. and J.B. Loomis, 2000. Using meta-analysis for benefit transfer: In sample convergent validity tests of an outdoor recreation database. *Water Resource Research*, 36(4), 1097-1101.

¹⁰¹ Walsh, R.G., D.M. Johnson, and J.R. McKean, 1992. Benefit transfer of outdoor recreation demand studies: 1968-1988. *Water Resource Research*, 28(3), 707-713.

138. To estimate the regional economic impacts resulting from lost OHV trips to ODSVRA, the analysis relies heavily on the work of Hendricks et al.¹⁰² Hendricks et al. surveyed visitors to ODSVRA from January 2005 through December 2005 and from January 2007 through April 2007 on randomly selected days. Data were collected on expenditures in the Five Cities area (Pismo Beach, Arroyo Grande, Oceano, Grover Beach, and Shell Beach) and in other areas of San Luis Obispo County. On average, OHV recreators in ODSVRA spent \$77.83 per visitor per trip in the Five Cities area and an additional \$5.70 per visitor per trip in other areas of San Luis Obispo County, totaling \$83.53 per visitor per trip for the County.¹⁰³ These expenditures are detailed in Exhibit 5-6. The authors then used this expenditure data in the IMPLAN model to determine the economic impact of visitors to ODSVRA.

EXHIBIT 5-6 AVERAGE EXPENDITURES PER VISITOR PER TRIP TO ODSVRA (2008 DOLLARS)

| EXPENDITURE CATEGORY | AVERAGE EXPENDITURE PER VISITOR PER TRIP | | |
|--|--|---------------------------------------|------------------------------|
| | FIVE CITIES AREA | OTHER AREAS IN SAN LUIS OBISPO COUNTY | SAN LUIS OBISPO COUNTY TOTAL |
| Lodging (hotel/motel/private campgrounds) | \$11.53 | \$2.06 | \$13.59 |
| Other public campground camping fees | \$1.88 | \$0.02 | \$1.90 |
| Food & beverage (restaurants, concessions, bars) | \$20.00 | \$1.67 | \$21.67 |
| Private auto expenses | \$18.99 | \$1.05 | \$20.04 |
| Retail shopping | \$13.43 | \$0.80 | \$14.23 |
| Recreation activities | \$6.59 | \$0.02 | \$6.61 |
| Other expenses | \$5.41 | \$0.08 | \$5.49 |
| Total expenditures | \$77.83 | \$5.70 | \$83.53 |
| Note: Totals may not sum due to rounding. | | | |

139. Regional economic modeling accounts for the interconnectedness of industries within a geographic area – that is, industries not only supply goods and services to consumers, but also to each other. Thus, spending in one economic sector tends to have a larger impact on the regional economy as a whole. This concept is commonly referred to as the “multiplier” effect. IMPLAN is a regional economic model used to quantify the dollar value of goods and services produced, and employment generated, by consumer expenditures. Commonly used by State and Federal agencies for policy planning and evaluation purposes, IMPLAN translates estimates of trip expenditures into changes in demand for inputs to affected industries.¹⁰⁴ The IMPLAN model draws upon data from

¹⁰² Hendricks, W. W. et al., 2007. Economic Impact of Oceano Dunes SVRA Visitors. Report prepared for CDPR by California Polytechnic State University, San Luis Obispo.

¹⁰³ Value adjustment from 2003 to 2008 dollars made using GDP Deflator inflation calculator available at: <http://cost.jsc.nasa.gov/inflateGDP.html>, accessed October 2008

¹⁰⁴ The IMPLAN model is owned and maintained by the Minnesota IMPLAN Group, Inc. (MIG). For more information see: IMPLAN Professional, Social Accounting and Impact Analysis Software, User’s Guide, Analysis Guide, Data Guide, Minnesota IMPLAN Group, Inc.

several Federal and State agencies, including the Bureau of Economic Analysis and the Bureau of Labor Statistics. Changes in output and employment are calculated for all industries and then aggregated to determine the regional economic contribution of OHV use to the relevant counties.

140. IMPLAN translates 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 OHV recreator expenditures on good and services, by sector);
- *Indirect effects* are changes in output industries that supply good and services to those that are directly affected by the initial change in expenditures; and,
- *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, changes in employment in a region may affect the consumption of certain goods and services.

141. There is one important caveat to the interpretation of IMPLAN model estimates. 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 this critical habitat are smaller than those estimated in the model, which will lead to an upward bias in the estimates.

142. The analysis by Hendricks et al. calculated the regional economic impacts for all ODSVRA OHV visitors. This analysis linearly scales the results of Hendricks et al. to reflect the regional economic impacts of lost visits due to the potential closure of portions of the riding area. Note that the impacts resulting from this scale are then inflated to 2008 dollars. The number of visitors lost is estimated in Section 5.5 for post-designation impacts.

5.3.3 CAVEATS

143. It is important to recognize the uncertainty inherent in the assumptions underlying this analysis. Exhibit 5-7 summarizes these uncertainties and their potential effect on estimated economic impacts.

EXHIBIT 5-7 SUMMARY OF CAVEATS TO RECREATION ANALYSIS

| ASSUMPTION | POTENTIAL EFFECT ON RESULTS |
|---|-----------------------------|
| The Service is not able to forecast with certainty whether critical habitat designation would result in the closure of a portion of ODSVRA. To the extent that a closure does not occur, forecast impacts associated with lost OHV trips will not occur. | + |
| Under the upper bound baseline and incremental scenarios, the analysis assumes that some people who would have made a trip to ODSVRA for OHV recreation will choose not to due to the potential future closure of La Grande Tract and five percent of the riding area. This assumption is supported by economic theory and the resource economics literature. However, there is no site-specific model available to estimate OHV-users' response to a change in access to ODSVRA. To the extent that visitation is not impacted as a result of the closures, the analysis may overstate consumer surplus and regional economic impacts. | + |
| The economic analysis relies on ODSVRA's prediction that annual visitation to the park will hold constant at roughly 2008 levels (two million visitors per year). If the demand for OHV visits were to change, this assumption would understate or overstate the present value impact of closures. | +/- |
| It is not possible, using existing data, to predict the percentage of OHV users who would visit areas of ODSVRA that are proposed for critical habitat. Lacking detailed visitation distribution and user pattern data, the analysis assumes a uniform distribution of visitation within the riding area and thus a decrease in OHV trips proportional to the decrease in the size of the riding area. To the extent that the portions of the riding area closed are more or less popular with OHV users than other portions of the riding area, the analysis could overstate or understate impacts by over- or underestimating the number of trips that could be lost. | +/- |
| For the purpose of estimating regional economic impacts, the study area has been defined to include the Five Cities area and other areas of San Luis Obispo County, California. The analysis focuses on these two areas because they are expected to bear the greatest impact of any reduced visitation by OHV enthusiasts to ODSVRA. The analysis does not estimate distributional impacts outside of these regions. To the extent that limitations on OHV activity within ODSVRA discourage OHV recreationists from purchasing goods and services at OHV-related businesses operating outside of the primary study area, these economies may be affected. | - |
| The analysis applied benefits transfer from other OHV sites to estimate the consumer surplus value per OHV vehicle trip at ODSVRA. The extent to which OHV recreators at ODSVRA may have a different consumer surplus value than those recreators in the transfer study is unknown. | +/- |
| Impacts resulting from a loss of social benefits (e.g., social benefits related to the "community" aspect of ODSVRA recreation, including forming bonds and transferring important family values to children, as well as strengthening the family as a unit and children as individuals) are not quantified in the report because data are not available to value these types of benefits that may be associated with OHV use. | - |
| The IMPLAN model that is used to estimate regional economic impacts is a static model and does not account for the fact that the economy will adjust. IMPLAN measures the effects of a specific policy change at one point in time. Over the long-run, the economic losses predicted by the model may be overstated as adjustments such as re-employment of displaced employees occurs. | + |
| +: This assumption may result in an overestimate of real costs. -: This assumption may result in an understatement of real costs. +/-: The assumption has an unknown effect on estimates. | |

5.4 PRE-DESIGNATION IMPACTS

144. This section estimates impacts to OHV recreation during the pre-designation time period beginning with the species’ listing in 2000 and continuing through 2008. During this time period there were no impacts to OHV recreation. The 2004 final rule designating the original critical habitat for the thistle did not designate habitat within the riding area, thus there were no impacts to OHV use.¹⁰⁵
145. ODSVRA has taken other measures to protect the thistle. The CDPR has been working on a multi-species HCP for certain state park lands in San Luis Obispo County. Management of the thistle within ODSVRA is accounted for in this HCP. Costs of the development of the HCP to include the thistle are not available at the writing of this report. The park has also undertaken rare plant surveys within the park to identify plant species, including the thistle. At this time, the number and cost of these surveys is unavailable.
146. Exhibit 5-8 presents total undiscounted and present value costs of thistle management activities within ODSVRA.

**EXHIBIT 5-8 ODSVRA PRE-DESIGNATION ECONOMIC IMPACTS
(2000 - 2008, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)**

| UNIT | UNDISCOUNTED COST | PRESENT VALUE COST |
|------------------------------|---|--------------------|
| 1: Callender-Guadalupe Dunes | HCP development and survey costs are unavailable at this time | |

5.5 POST-DESIGNATION IMPACTS

147. This section estimates potential impacts of the thistle on recreation over the next 20 years (2009 – 2028), measured in terms of efficiency effects and regional economic impacts. The analysis attributes impacts to the baseline or as incremental effects of the proposed critical habitat designation.

5.5.1 BASELINE IMPACTS

148. Whether OHV access in La Grande Tract will be limited in the future depends upon the outcome of efforts by CDPR to purchase this land from the county and, potentially, upon the outcome of a lawsuit against the CDPR over allowing OHV use in La Grande Tract. Given this uncertainty, and in the absence of a site-specific model to understand visitor behavior, a bounding analysis is presented. Any action short of complete closure of La Grande Tract or any scenario in which visitors respond to the closure in a manner other than taking fewer trips to ODSVRA would generate an impact between these two bounds.
- At the lower bound, the analysis assumes that La Grande Tract continues in its current use as part of ODSVRA. In this scenario, OHV use within La Grande Tract

¹⁰⁵ 2004 Final Rule, 69 FR 12553.

is not restricted and therefore visitation levels are not affected. Absent critical habitat designation, CDPR will consult with the Service under section 10 for approval of its HCP, and the Service will conduct an internal consultation under section 7 of the Act. The costs of these section 10 deliberations are assumed to be incurred at some point in the future when the HCP is complete. Additional costs associated with addressing the adverse modification standard are included in the incremental impacts section.

- At the upper bound, the analysis assumes that some people who would have made a trip to ODSVRA for OHV recreation will choose not to due to the closure of La Grade Tract. The upper-bound baseline impact also includes the cost of addressing the jeopardy standard in CDPR's consultation with the Service for approval of its HCP.

Lower-bound Baseline Impacts

149. In the lower-bound baseline scenario, the analysis assumes that no restrictions are placed on OHV use and therefore visitation levels are not affected; thus, no welfare impacts associated with OHV recreation are forecast. The administrative cost of addressing the jeopardy standard in CDPR's consultation with the Service for approval of its HCP is included in the lower-bound scenario. Because the timing of the future consultation is unknown, costs are conservatively assigned to the earliest possible year, 2009.

Upper-Bound Baseline Impacts

150. To estimate the welfare effects of lost OHV use under the upper-bound baseline scenario, the analysis first forecasts OHV visitation for ODSVRA absent the closure of La Grande Tract, and then estimates the portion of this visitation attributable to La Grand Tract.
151. As discussed in section 5-2, total attendance has held steady around two million annually since 2005. The staff at ODSVRA feels that, absent the closure of any portion of the riding area, visitation will remain at about two million for the next 20 years.¹⁰⁶ While the park is not at capacity mid-week, it does reach maximum capacity on weekends, around holidays, and during the summer months. The park does not expect mid-week visitation to increase substantially and thus the park is effectively operating at capacity. The park does not explicitly count the number of OHVs allowed within the SVRA, but estimates that 60 to 70 percent of park visitors are OHV users.¹⁰⁷ Taking the average of this range, the analysis assumes that 65 percent of visitors to the park are OHV users, or roughly 1.3 million visitors per year. The analysis holds visitation constant at this level through 2028.
152. It is not possible, using existing data, to predict the percentage of OHV users who would visit La Grande Tract. Lacking detailed visitation distribution and user pattern data, the analysis assumes a uniform distribution of visitation within the riding area. It also assumes a decrease in OHV trips proportional to the size of La Grande Tract. La Grande

¹⁰⁶ ODSVRA visitation is dependent upon a number of factors that are difficult to predict including gas prices and economic conditions. If visitation is less/greater than two million per year the analysis will over/understate present value impact of closures.

¹⁰⁷ Personal communication, A. Zilke and R. Glick, ODSVRA, October 10, 2008.

Tract represents 28 percent of the riding area.¹⁰⁸ Therefore, the analysis assumes that closure of this area would decrease visitation by 28 percent, or 364,000 visits per year.

- 153. To estimate welfare effects of these lost OHV visits, the analysis multiplies a per-person per-day consumer surplus value by the forecast loss of 364,000 visitors per year. As discussed previously, a per-trip consumer surplus value of \$57 (2008 dollars) is applied, based on benefit transfer.
- 154. Also included in the upper-bound baseline impact estimate is the administrative cost of addressing the jeopardy standard in CDPR’s consultation with the Service for approval of its HCP. Similar the lower-bound impact estimate, this cost is assumed to be incurred in 2009. There may also be some cost incurred due to fence installation and maintenance around La Grande Tract, but it is unclear who would undertake the task of fencing (ODSVRA, the county, or any new owner of this land). Costs associated with fencing are expected to be minimal compared to the welfare effects of closing La Grande Tract.
- 155. Exhibit 5-9 summarizes the lower and upper-bound baseline impacts.

**EXHIBIT 5-9 ODSVRA POST-DESIGNATION BASELINE ECONOMIC IMPACTS
(2009 - 2028, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)**

| UNIT | LOWER-BOUND IMPACTS | | | UPPER-BOUND IMPACTS | | |
|------------------------------|---------------------|--------------------|-----------------|---------------------|--------------------|-----------------|
| | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST |
| 1: Callender-Guadalupe Dunes | \$15,000 | \$14,000 | \$1,240 | \$415,000,000 | \$220,000,000 | \$19,400,000 |

5.5.2 INCREMENTAL IMPACTS

- 156. Whether OHV access in ODSVRA will be limited in the future as a result of the critical habitat designation will depend on the outcome of future management decisions and consultations. The CDPR is likely to wait until after the final critical habitat designation before consulting with the Service on its future management of ODSVRA. Given this uncertainty and in the absence of a site-specific model to understand visitor behavior, a bounding analysis is presented. As noted above, it is likely that any management action short of closure of five percent of the riding area or any scenario in which visitors respond to any potential closures in a manner other than taking fewer trips to ODSVRA would generate an impact between these two bounds. Included within these two bounds is the Service’s “most likely impact” of 2.4 percent of the riding area.¹⁰⁹

¹⁰⁸ Between March 1 and September 30 La Grande Tract represents 29 percent of the riding area. Between October 1 and February 28 La Grande Tract represents 26 percent of the riding area. A weighted annual average of 28 percent is used in the analysis.

¹⁰⁹ Written Communication. M. Elvin and C. Rutherford, Ventura Fish and Wildlife Office. December 17, 2008.

- At the lower bound, the analysis assumes that no restrictions are placed on OHV use within the park and therefore visitation levels are not affected. The lower-bound impact includes the cost of incorporating the thistle critical habitat into the HCP, the cost of regular monitoring of the riding area to identify plants that may become established, and the incremental cost of considering adverse modification in the Service's internal section 7 consultation on the HCP.
- At the upper bound, the analysis assumes that some people that would have made a trip to ODSVRA for OHV recreation will choose not to due to the closure of five percent of the riding area. The upper-bound impact also includes the cost of installing and maintaining a fence around the closed portion of the riding area as well as the cost of incorporating the thistle critical habitat into the HCP and the incremental cost of considering adverse modification in the Service's internal section 7 consultation on the HCP.

Lower-bound Incremental Impacts

157. Under the lower-bound scenario, the analysis assumes that no restrictions are placed on OHV use and therefore visitation levels are not affected; thus, no welfare impacts are forecast. An estimated cost of incorporating the thistle critical habitat into the HCP was provided by ODSVRA staff. This one-time cost of \$2,500 is incurred in the first year of the post-designation period (2009).¹¹⁰ An estimated cost of monitoring for the thistle on the proposed critical habitat within the riding area was also provided by ODSVRA staff. This monitoring cost estimate assumes that the proposed critical habitat within the riding area is left open to OHV use and therefore will require regular monitoring to identify plants that may become established. This annual cost of \$3,200 is incurred in every year of the post-designation time period.¹¹¹

Upper-bound Incremental Impacts

158. To estimate the welfare effects of lost OHV use under the upper-bound scenario, the analysis first forecasts OHV visitation for ODSVRA absent any closure resulting from the proposed critical habitat designation, and then estimates the portion of this visitation which is attributable to the five percent of the riding area potentially subject to closure after critical habitat is designated.
159. As discussed in the baseline impacts section above, the analysis assumes that ODSVRA receives 1.3 million OHV visitors per year. The analysis holds visitation constant at this level through 2028. Due to a lack of detailed visitation distribution and user pattern data, the analysis assumes a uniform distribution of visitation within the riding area and thus a

¹¹⁰ Written communication, R. Glick, ODSVRA, October 20, 2008. The cost estimate of \$2,500 includes: 10 hours of Principal staff time at \$100/hour, 10 hours of GIS staff time at \$50/hour, 10 hours of Senior Environmental Scientist time at \$50/hour, 15 hours of Office staff time at \$30/hour, and \$50 for miscellaneous expense. This cost assumes minimal consultation with the Service on the critical habitat designation and represents a low-end estimate.

¹¹¹ Written communication, R. Glick, ODSVRA, October 20, 2008. The cost estimate of \$3,200 includes: 10 hours of Senior Environmental Scientist time at \$50/hour, 25 hours of Environmental Scientist time at \$40/hour, 80 hours of Seasonal Labor staff time at \$20/hour, and \$100 for miscellaneous expense.

decrease in OHV trips proportional to the size of the area potentially subject to closure after critical habitat is designated. Therefore, a closure of five percent of the riding area will lead to a five percent decrease in OHV visitation, or 65,000 visitors per year.

160. To estimate welfare effects of these lost OHV visits, the analysis multiplies a per-person per-day consumer surplus value by the forecast loss of 65,000 visitors per year. As discussed previously, a per-trip consumer surplus value of \$57 (2008 dollars) is applied, based on benefit transfer.
161. It should be noted that there may be some welfare gains associated with the closure of this portion of the riding area. Non-OHV recreators (e.g., beach-going recreators, hikers, wildlife enthusiasts) may experience benefits when this area is closed to OHV use. The lack of OHVs in this area might increase their enjoyment of the park and even lead to increased visits to the park by these types of users. The number of increased visits by non-OHV recreators to the park due to the closure of this area is hard to predict given available data. Furthermore, ODSVRA staff indicates that “considering that the primary reason people come to the park is for OHV recreation, it is doubtful that there would be a significant increase in other uses, particularly uses that would offset the loss.”¹¹²
162. Also included in the upper-bound impact estimate are the costs of incorporating the thistle critical habitat into the HCP (\$2,500), fence installation, and fence maintenance. Fence installation occurs in the first year of the post-designation time period (2009). The one time cost of installing a fence around the areas being proposed for closure is estimated to be roughly \$8,780. The cost of maintaining this fence is roughly \$5,610 per year and is incurred annually every year after the fence is installed.¹¹³
163. Exhibit 5-10 summarizes the upper- and lower-bound incremental impacts.

**EXHIBIT 5-10 ODSVRA INCREMENTAL ECONOMIC IMPACTS
(2009 - 2028, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)**

| UNIT | LOWER-BOUND IMPACTS | | | UPPER-BOUND IMPACTS | | |
|------------------------------|---------------------|--------------------|-----------------|---------------------|--------------------|-----------------|
| | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST |
| 1: Callender-Guadalupe Dunes | \$71,500 | \$40,900 | \$3,610 | \$74,200,000 | \$39,300,000 | \$3,470,000 |

¹¹² Written communication, A. Zilke, ODSVRA, November 10, 2008.

¹¹³ Written communication, K. Holt via A. Zilke, ODSVRA, October 20, 2008. ODSVRA provided cost estimates for installation and annual maintenance of a 20,000 foot fence needed to close the entire area proposed for designation within the riding area. Because of the uncertainty surrounding exactly what areas may be recommended for closure, the cost estimates provided were scaled back based on area to determine the cost of closing five percent of the riding area. The cost estimate for installation includes approximately \$2,600 for materials, \$4,920 for labor, and \$1,260 for equipment and tools. The cost estimate for maintenance includes approximately \$1,250 for materials, \$3,120 for labor, and \$1,250 for equipment and tools.

5.5.3 POST-DESIGNATION REGIONAL ECONOMIC IMPACTS

164. This section presents the potential post-designation regional economic impacts that could result from the closure of portions of the riding area at ODSVRA. Regional economic impacts of lost OHV visitation are calculated using estimates of the total number of visitors lost due to the closure of portions of the riding area and the findings of Hendricks et al.¹¹⁴ It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses such as the welfare losses measured in this chapter. 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.
165. Under the lower-bound scenario, the analysis assumes that no restrictions are placed on OHV use and therefore visitation levels are not affected; thus, no regional economic impacts are forecast.
166. Under the upper-bound baseline scenario, forecast reductions in OHV use are based on the assumption that La Grande Tract is closed to OHV use. This closure results in 364,000 lost OHV visits. Under the upper-bound incremental scenario, forecast reductions in OHV use are based on the assumption that five percent of the riding area is closed to OHV use due to proposed critical habitat designation. This closure results in 65,000 lost OHV visits. Hendricks et al. found that approximately 6.5 percent of OHV visitors to the ODSVRA are from San Luis Obispo County. The number of lost visitors is reduced by this percent so that the economic impacts reflect only visitor dollars brought into the area to avoid double-counting. Therefore, the baseline regional economic impact of 340,340 visitors and the incremental regional economic impact of 60,775 visitors to ODSVRA are calculated. Hendricks et al. calculate the economic impacts of 1,365,373 visitors. The baseline and incremental impacts calculated for this analysis will be approximately 25 and 4.5 percent, respectively, of those calculated by Hendricks et al.
167. Exhibit 5-11 presents the total direct expenditures associated with potential lost OHV visitation in the baseline and incremental to the baseline. Expenditures are given for the Five Cities area, other areas of San Luis Obispo County, and then for all of San Luis Obispo County. These figures are based on the expenditure data collected by Hendricks et al. and presented in Exhibit 5-6. The IMPLAN model translates these direct expenditures into total potential regional economic impacts.

¹¹⁴ Hendricks, W. W. et al., 2007. Economic Impact of Oceano Dunes SVRA Visitors. Report prepared for CDPR by California Polytechnic State University, San Luis Obispo.

EXHIBIT 5-11 POTENTIAL REDUCTION IN OHV-RELATED DIRECT EXPENDITURES (2008 DOLLARS)

| EXPENDITURE CATEGORY | FIVE CITIES AREA | OTHER AREAS OF SAN LUIS OBISPO COUNTY | SAN LUIS OBISPO COUNTY TOTAL |
|--|---------------------|---------------------------------------|------------------------------|
| Baseline Upper-bound Scenario | | | |
| Lodging (hotel/motel/private campgrounds) | \$3,920,000 | \$701,000 | \$4,630,000 |
| Other public campground camping fees | \$640,000 | \$6,810 | \$647,000 |
| Food & beverage (restaurants, concessions, bars) | \$6,810,000 | \$568,000 | \$7,380,000 |
| Private auto expenses | \$6,460,000 | \$357,000 | \$6,820,000 |
| Retail shopping | \$4,570,000 | \$272,000 | \$4,840,000 |
| Recreation activities | \$2,240,000 | \$6,810 | \$2,250,000 |
| Other expenses | \$1,840,000 | \$27,200 | \$1,870,000 |
| Total expenditures | \$26,500,000 | \$1,940,000 | \$28,400,000 |
| Incremental Upper-bound Scenario | | | |
| Lodging (hotel/motel/private campgrounds) | \$701,000 | \$125,000 | \$826,000 |
| Other public campground camping fees | \$114,000 | \$1,220 | \$115,000 |
| Food & beverage (restaurants, concessions, bars) | \$1,220,000 | \$101,000 | \$1,320,000 |
| Private auto expenses | \$1,150,000 | \$63,800 | \$1,220,000 |
| Retail shopping | \$816,000 | \$48,600 | \$865,000 |
| Recreation activities | \$401,000 | \$1,220 | \$402,000 |
| Other expenses | \$329,000 | \$4,860 | \$334,000 |
| Total expenditures | \$4,730,000 | \$346,000 | \$5,080,000 |
| Notes: Totals may not sum due to rounding. | | | |

168. Baseline and incremental regional economic impacts associated with the upper bound scenarios are presented in Exhibit 5-12. The figures for San Luis Obispo County include the impacts to the Five Cities area. There are a variety of ways to measure regional economic impacts, including impacts to output and unemployment which are summarized in Exhibit 5-12. The output estimates include direct, indirect, and induced effects. As illustrated in Exhibit 5-12, the potential impact of closing La Grande Tract in San Luis Obispo County is a loss of \$30.5 million in total output or 432 lost jobs. The potential impact resulting from critical habitat designation on San Luis Obispo County is a loss of \$5.49 million in total output or 78 lost jobs. For both baseline and incremental, the majority of these impacts would be in the Five Cities area (86 percent of lost output and 72 percent of lost jobs).

EXHIBIT 5-12 POTENTIAL REGIONAL ECONOMIC IMPACTS (2008 DOLLARS)

| OUTPUT | | EMPLOYMENT (JOBS) | |
|---|------------------------|-------------------|------------------------|
| FIVE CITIES AREA | SAN LUIS OBISPO COUNTY | FIVE CITIES AREA | SAN LUIS OBISPO COUNTY |
| Baseline Upper-bound Scenario | | | |
| \$26,300,000 | \$30,500,000 | 313 | 432 |
| Incremental Upper-bound Scenario | | | |
| \$4,730,000 | \$5,490,000 | 56 | 78 |

CHAPTER 6 | RESIDENTIAL AND COMMERCIAL DEVELOPMENT

169. This chapter considers potential impacts to residential and commercial development within the proposed critical habitat. Significant protection of habitat in Unit 2 is already likely due to the presence of designated critical habitat for the California tiger salamander. Future impacts are primarily anticipated in Unit 2 due to delays associated with the permitting and the section 7 consultation process. These impacts, however, are likely to occur regardless of whether critical habitat is designated for the thistle and thus are attributed to the baseline. Impacts are summarized in Exhibit 6-1 and discussed in detail below.

EXHIBIT 6-1 SUMMARY OF IMPACTS TO DEVELOPMENT
(2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

| UNIT | PRESENT VALUE IMPACTS |
|--|-----------------------|
| Pre-Designation Impacts (2000 - 2008) | |
| 1: Callender-Guadalupe Dunes | \$0 |
| 2: Santa Maria River-Orcutt Creek | \$243,000,000 |
| 3: Cañada de las Flores | \$0 |
| Total | \$243,000,000 |
| Post-Designation Baseline Impacts (2009 - 2028) | |
| 1: Callender-Guadalupe Dunes | \$0 |
| 2: Santa Maria River-Orcutt Creek | \$9,560,000 |
| 3: Cañada de las Flores | \$0 |
| Total | \$9,560,000 |
| Incremental Impacts (2009 - 2028) | |
| 1: Callender-Guadalupe Dunes | \$0 |
| 2: Santa Maria River-Orcutt Creek | \$4,670 |
| 3: Cañada de las Flores | \$0 |
| Total | \$4,670 |
| Note: Totals may not sum due to rounding. | |

6.1 BACKGROUND INFORMATION

6.1.1 DEVELOPMENT PRESSURES IN THE PROPOSED CRITICAL HABITAT

170. In its 2002 report detailing future population growth and development, Santa Barbara County Planning and Development estimated growth in the County of at least 160,000 people over the next 30 years.¹¹⁵ To accommodate growth of this magnitude, as many as 15,000 acres may be required for residential development.¹¹⁶ Meanwhile, the amount of land available for development is shrinking. All of the urban centers within Santa Barbara County have nearly exhausted the potential for future residential development, with the exception of the cities of Santa Maria and Orcutt. Within these communities, development is orchestrated through community planning documents administered by the city governments. The details of these plans, specific projects likely to occur within the time period of this analysis, and expected impacts related to critical habitat designation are described in detail in the following sections.

6.1.2 SECTION 7 CONSULTATION HISTORY

171. As described in the baseline chapter, the proposed critical habitat overlaps with habitat for several other endangered species including California red-legged frog, California tiger salamander, Lompoc yerba santa, and a number of other plant species. This overlap has important implications for determining whether impacts to development are incremental to this rule. In areas of the proposed critical habitat where other endangered species or their critical habitat exists, any development projects will already be subject to CEQA review and, if a nexus is present, section 7 consultation.
172. Since the listing of the thistle, there has only been one consultation related to development that addressed this species. In the biological opinion for the DJ Farms residential development, the Service determined that development was not likely to adversely modify thistle critical habitat, and no project modifications were requested for protection of the species or its critical habitat.^{117, 118} Due to the limited history of consultation, it is difficult to predict future project modifications related to this activity. In addition, since there is no “take” restriction for plants, terms and conditions specifying project modifications cannot be required by the Service during the consultation process.¹¹⁹ However, the Service will consider whether a project will adversely modify

¹¹⁵ [2002 SB County Report] as cited in: 2004 Final Rule, 69 FR 68588.

¹¹⁶ Ibid.

¹¹⁷ Biological Opinion for the DJ Farms Residential Development Project, Guadalupe, Santa Barbara County, California (1-8-07-F-60), January 4, 2008.

¹¹⁸ The administrative cost of this consultation (\$15,000, undiscounted) is included as a pre-designation baseline cost during the year the biological opinion was issued, 2008.

¹¹⁹ Written communication with Service Biologists, Ventura Fish and Wildlife Office, November 14, 2008.

thistle critical habitat and may suggest reasonable and prudent alternatives.¹²⁰ The Service cannot anticipate the reasonable and prudent alternatives.¹²¹

6.1.3 REGULATION OF DEVELOPMENT BY COUNTY GOVERNMENT

173. As described in Chapter 3, CEQA requires State and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if possible. Generally, most large real estate development projects are required under CEQA to submit an EIR, which includes consideration of all potential environmental impacts, including biological and/or habitat-related impacts, irrespective of the presence of designated critical habitat. However, according to a representative of the Santa Barbara County Department of Building and Planning, for projects where endangered species or critical habitat are identified, at some point in the CEQA process, the Service is contacted to provide input on the proposed project.¹²² Generally, informal consultation is sought prior to the approval of the project.¹²³
174. Smaller development projects are often able to avoid the most onerous aspects of CEQA compliance by obtaining an approved “negative declaration” or through a categorical exemption. In such cases, the presence of listed species or designated critical habitat may trigger the need for an EIR, significantly increasing administrative expense, as well as potentially delaying the start of the project during county review and informal consultation between the county and the Service. Furthermore, this process may result in requests from the Service or the county to modify project plans.
175. The time period from the initial submission of a project for county review to the final approval and granting of a permit can be highly variable. For example, the average time period for CEQA review in Santa Barbara for a residential project is one and a half to two years; if the time to remit the project for review by the Service is included, the duration for one such project was four years.¹²⁴

6.2 POTENTIAL DEVELOPMENT IN PROPOSED CRITICAL HABITAT

176. The first step in evaluating potential impacts to development involves identifying the area open to future development activity and the nature of proposed development in those areas. Within the proposed critical habitat, residential or commercial development is only expected in Unit 2. Units 4, 5, and 6 are almost entirely owned by Vandenberg Air Force Base and are considered separately in Chapter 4. Unit 3 is privately held, however discussions with the landowner indicate that neither residential nor commercial development is likely.¹²⁵ Only a small portion of Unit 1 is privately owned; at this time,

¹²⁰ Ibid.

¹²¹ Ibid.

¹²² Personal communication, Santa Barbara County Planning Development, October 30, 2008.

¹²³ Ibid.

¹²⁴ Personal communication, D. Swen and L. Tamura, Urban Planning Concepts, October 30, 2008.

¹²⁵ Personal communication, Four Deer LLC., November 4, 2008.

no information regarding future development is available, although it is expected to be minimal given the distance from urban centers.¹²⁶

177. Within Unit 2, approximately 1,640 acres of land are currently zoned for development. This estimate is based on land use information provided by Santa Barbara County.¹²⁷ Areas of future development are centered around the cities of Guadalupe and Orcutt, which are within or adjacent to the proposed designation. Both of these cities have specific plans outlining future development that are detailed below, along with a discussion of specific projects expected in the future.

Orcutt Community Plan - Key Site 22

178. The Orcutt Community Plan (OCP) was adopted in 1997 and it continues to guide development planning in the city today.¹²⁸ The plan identifies areas for potential future development in addition to setting aside open space and agricultural land for preservation. One area specifically slated for future development is Key Site 22. This site is located in Unit 2, contiguous with Route 1. It constitutes the only area which is currently open for development within the OCP and it is likely to be developed within the next 20 years.¹²⁹
179. Key Site 22 consists of 16 parcels comprising nearly 1,180 acres.¹³⁰ Approximately 480 acres are in agricultural production, while the remainder of the site is generally open space with some grazing and a small number of single-family homes. Development would be clustered within 743 acres that are currently used for grazing or agriculture, into as many as 3,000 units. The site contains Orcutt Creek and substantial vernal pool resources home to California tiger salamander and other rare species. Importantly, the site is located entirely within currently designated critical habitat for the California tiger salamander.¹³¹ According to the OCP, a specific, phased development plan is required prior to project initiation.

Rancho Maria Golf Course

180. Approximately 200 one-family units have been proposed for construction in between the fairways of Rancho Maria golf course. The project is currently going through the CEQA process. California tiger salamanders were found on the proposed project site and the project proponent is currently considering options for mitigating impacts to this species.

¹²⁶ To date, representatives of the San Luis Obispo County planning department have not responded to requests for information regarding potential future uses of private parcels in Unit 1.

¹²⁷ This analysis is based on the "General Plan Land Use" GIS file (updated October 27, 2008). Provided by Santa Barbara County Enterprise GIS via: <http://www.countyofsb.org/itd/gis/default.aspx> on October 22, 2008. It reflects the Comprehensive Plan and Coastal Plan Land Use Designations adopted by Santa Barbara County Board of Supervisors. Categories included in this estimate are: commercial, residential, industrial, and utility.

¹²⁸ Personal communication, D. Swen and L. Tamura, Urban Planning Concepts, October 30, 2008.

¹²⁹ Ibid.

¹³⁰ Orcutt Community Plan, Revised August 2005.

¹³¹ 69 FR 68588. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the California tiger salamander (*Ambystoma californiense*) in Santa Barbara County; Final Rule.

At this time, it is not clear whether this project is within the proposed critical habitat for thistle.

Rice Ranch

181. Rice Ranch is a recently approved housing development off of Route 101 in Orcutt. The development will contain 750 homes, portions of which overlap with the proposed critical habitat.¹³² This area has already been through the county permitting process and is under construction. The Rice Ranch developers never entered into section 7 consultation with the Service and therefore consultation can not be reinitiated due to the designation of thistle critical habitat. Therefore no impacts to this development are expected related to designation of critical habitat for thistle.

City of Guadalupe - Minami annexation project

182. The City of Guadalupe is just outside of critical habitat and existing urban development runs along the fringes of the habitat, but does not significantly overlap with it.¹³³ In the northeast corner of the City, the Minami annexation project is currently underway. While this project is affected by the current critical habitat designation, under the proposed revision, the area would be outside of the boundary of critical habitat.¹³⁴ Therefore, no impacts to this project are expected due to the proposed designation.

6.3 ESTIMATING BASELINE IMPACTS TO DEVELOPMENT

183. As discussed in the previous section, the primary area of expected development is Key Site 22 in Orcutt, which falls entirely within critical habitat for California tiger salamander. Therefore, any impacts to this site will be driven by efforts to protect this species and its habitat and are therefore considered to be part of the baseline. Expected impacts to development include land set-asides, development delays, and administrative costs of consultation. The methods for estimating these impacts and the results are presented below.

6.3.1 LAND SET-ASIDES AND LOST DEVELOPMENT POTENTIAL

184. The economic analysis accompanying the 2004 designation of critical habitat for California tiger salamander predicted that the Service would require land set-asides at a ratio of 3:1 for mitigating threats to the species and its habitat.¹³⁵ In other words, the analysis anticipated that 75 percent of the land targeted for development and overlapping critical habitat will not be developed. The report estimated that the land value loss in the unit including Key Site 22 totaled \$161 million, and that loss occurred in 2004, when

¹³² Personal communication, D. Swenk and L. Tamura, Urban Planning Concepts, October 30, 2008.

¹³³ Written communication, R. Mullane, Rincon Consultants, November 10, 2008.

¹³⁴ Ibid.

¹³⁵ Economic and Planning Systems (EPS), 2004. Draft Economic Analysis of Critical Habitat Designation for the California Tiger Salamander, Santa Barbara County. Prepared for the U.S. FWS.

critical habitat for the California tiger salamander was designated.¹³⁶ In present value terms, that loss is approximately \$243 million (2008 dollars). This value overstates the loss associated with Key Site 22, because the relevant critical habitat unit for the California tiger salamander also included other potentially developable areas.

185. Presumably, this loss has already occurred and is reflected in the current market value of land in Key Site 22. This analysis also assumes that these set-asides will be configured in such a way as to protect the thistle as well as the California tiger salamander, and additional project modifications will not be required for the thistle or its habitat. As a result, the land value losses are assigned to 2004, the year critical habitat was finalized for the California tiger salamander. Note that if critical habitat for the California tiger salamander is removed prior to the development of these properties, the critical habitat designation for the thistle may preclude full recovery of the market value of these properties.

6.3.2 EIR AND DELAY COSTS

186. Development delay costs reflect the opportunity cost of not being able to develop for some period of time. The delay cost (an asset holding cost) is the amount of interest that the value of the asset could have made as a financial asset during that period. This is calculated by multiplying the value of the land by the market interest rate and the delay period. This analysis assumes a market interest rate of 7.0 percent.
187. According to the OCP, an EIR was developed for Key Site 22 in 1995. Because this effort occurred prior to the listing of the thistle, it is not included in the pre-designation cost estimate. Although an EIR has already been developed, prior to the initiation of actual construction, further permitting is likely required for the Key Site 22 site. In particular, because the site contains Orcutt Creek and substantial vernal pool resources, a Federal nexus with the U.S. Army Corps of Engineers is likely. In addition, since the thistle critical habitat is new to this geographic area, the EIR likely does not address thistle and its habitat.¹³⁷ Section 7 consultation is likely to result in some delay to the initiation of development.
188. Discussions with local planning agencies indicate that the delay for CEQA can reach two years, with an additional six months for section 7 consultation. However, because an EIR has already been completed, this analysis assumes that the delay would only originate from the consultation process, resulting in a delay of six months. This analysis conservatively assumes that the entire Key Site 22 project site is delayed, and the delay period occurs in 2009. Assuming a seven percent discount rate, this loss is estimated to be \$9.56 million in present value 2008 dollars.¹³⁸

¹³⁶ Market values for land are based on the present value of the best future use of the land. If a regulation modifies the potential future use, the change in the value of that land will be reflected immediately, even if development does not occur for some years into the future.

¹³⁷ As of yet, we do not have access to this EIR, but more specific information will be forthcoming if it becomes available.

¹³⁸ The estimate of delay costs is an approximation based on the total land value losses estimated in the relevant unit of the California tiger salamander critical habitat economic analysis. Specifically, the 3:1 set-aside results in a present value loss

6.3.3 SECTION 7 CONSULTATION COSTS

189. According to the OCP, prior to the development of Key Site 22, a specific plan for carrying out that development is required. Due to this requirement and because information regarding expected project size is not available, this analysis assumes that a single developer will propose to develop the site. Due to the presence of a creek and other significant vernal pool resources, it is also assumed that at least one consultation will be required via 404 permit from the USACE, resulting in a cost of \$15,000, in undiscounted dollars, expected to be incurred at the initiation of the project in 2009. This consultation would also consider other species and would be required absent the proposed critical habitat, thereby rendering it a baseline cost.

6.4 ESTIMATING INCREMENTAL IMPACTS TO DEVELOPMENT

190. As previously described, the presence of California tiger salamander critical habitat at Key Site 22, and the significant amount of land anticipated to be set-aside on-site for this species, suggests that additional project modifications for thistle critical habitat are unlikely. However, if the set-asides cannot be configured in a way to provide adequate protection for the thistle and additional project modifications are required then these costs would be considered incremental of the proposed critical habitat designation. The designation would require specific consideration of thistle critical habitat in the section 7 consultation, which represents an incremental cost of \$5,000 in undiscounted dollars.

of \$211 million. Therefore, the entire value of the area projected to be developed is assumed to be \$281 million. Note that the area in the relevant California tiger salamander report encompasses land outside of Key Site 22 and therefore overstates impacts associated with this particular site.

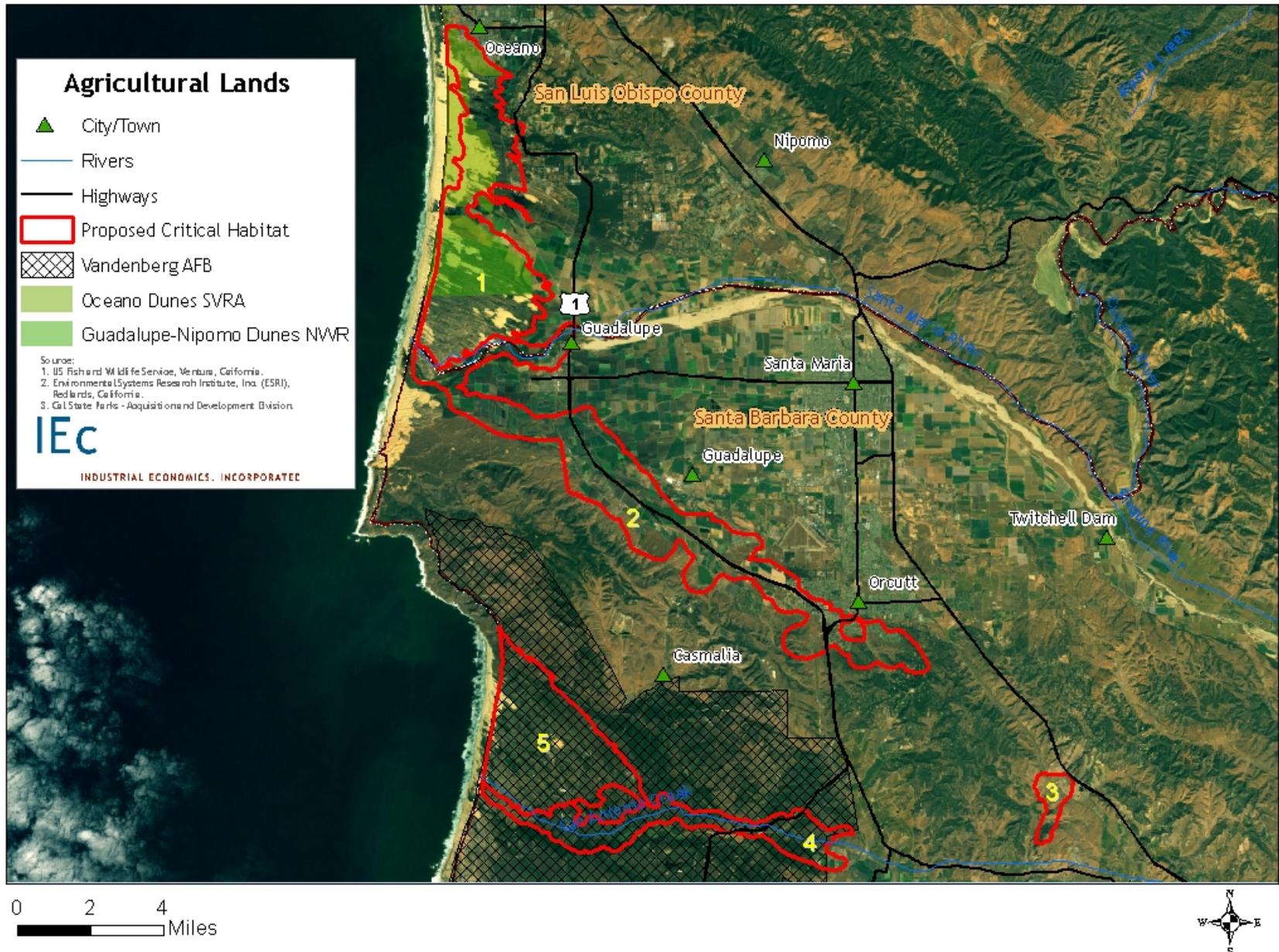
CHAPTER 7 | AGRICULTURE AND RANCHING

191. Agriculture is a major land use in the study area. The vast majority of the land in critical habitat Units 4, 5, and 6 is part of Vandenberg Air Force Base. The impacts to Vandenberg Air Force Base are discussed in Chapter 4. This chapter will focus on privately-owned lands in Units 1 (Callender-Guadalupe Dunes), 2 (Santa Maria River-Orcutt Creek), and 3 (Cañada de las Flores) that are used for agriculture and ranching.
192. Exhibit 7-1 depicts critical habitat Units 1, 2, and 3. Most of Unit 1 is located within Guadalupe-Nipomo Dunes NWR and ODSVRA. There is some land along Oso Flaco Creek in private ownership. A substantial portion of Unit 2 is in private ownership and used for agriculture. The land north of Route 1 is used for vegetable row crops (broccoli, lettuce, cauliflower, etc.), while the land south of Route 1 has sub-prime, sandy soil and is used for crops like strawberries and gladiolas.¹³⁹ Unit 3 is currently used for cattle ranching and farming activities, but the south-facing slopes are desirable for a vineyard.¹⁴⁰
193. Historically the thistle has had little impact on agricultural and ranching activities. Although agricultural development and grazing are listed as threats in the proposed rule, these activities generally lack a Federal nexus, and thus do not require consultation with the Service.
194. This Chapter begins with an overall summary of impacts to agriculture and ranching. Next, past and likely future agriculture and ranching activities within the study area are discussed, followed by the presentation of pre- and post-designation impacts.

¹³⁹ Personal communication, D. Swenk and L. Tamura, Urban Planning Concepts, October 30, 2008.

¹⁴⁰ Personal communication, K. Hunter and E. Vasquez, November 4, 2008.

EXHIBIT 7-1 AGRICULTURAL LANDS IN PROPOSED CRITICAL HABITAT



7.1 SUMMARY OF IMPACTS TO AGRICULTURE AND RANCHING

195. This section presents a brief summary of pre- and post-designation impacts; details of the analysis and assumptions underlying the analysis are included in the following sections. Exhibit 7-2 summarizes pre- and post-designation impacts. Although the pre-designation impacts occurred in Unit 1, all of the post-designation impacts are expected to occur in Units 2 and 3 where there is abundant privately-owned agricultural land.

**EXHIBIT 7-2 SUMMARY OF IMPACTS TO AGRICULTURE AND RANCHING
(2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)**

| UNIT | PRESENT VALUE IMPACTS |
|--|------------------------------------|
| Pre-Designation Impacts (2000 - 2008) | |
| 1: Callender-Guadalupe Dunes | \$19,700 |
| 2: Santa Maria River-Orcutt Creek | \$0 |
| 3: Cañada de las Flores | \$0 |
| Total | \$19,700 |
| Post-Designation Baseline Impacts (2009 - 2028) | |
| 1: Callender-Guadalupe Dunes | \$0 |
| 2: Santa Maria River-Orcutt Creek | \$121,000 |
| 3: Cañada de las Flores | \$93,500 |
| Total | \$215,000 |
| Incremental Impacts (2009 - 2028) | |
| 1: Callender-Guadalupe Dunes | \$0 |
| 2: Santa Maria River-Orcutt Creek | Potential unquantified delay costs |
| 3: Cañada de las Flores | Potential unquantified delay costs |
| Total | Unquantified |
| Note: Totals may not sum due to rounding. | |

7.2 AGRICULTURE AND RANCHING ACTIVITIES IN THE STUDY AREA

196. This section provides information on past and likely future agriculture and ranching activities that may affect the thistle and its habitat.

7.2.1 PAST ACTIVITIES

197. Since the species listing in 2000 there has only been one section 7 consultation pertaining to agriculture and ranching for the thistle and/or its habitat. In 2004, the Service conducted a formal consultation with the U.S. Department of Agriculture's Natural Resource Conservation Service (NRCS) on a sediment removal project in Oso Flaco Creek and its tributary. The NRCS provided cost-share assistance on this project through the Environmental Quality Incentive Program.

198. This is the only known agricultural activity to have been affected by the thistle and/or its habitat within the study area.

7.2.2 LIKELY FUTURE ACTIVITIES

199. The most likely Federal nexus for section 7 consultation associated with agricultural and ranching activities is voluntary funding, or cost-sharing, from the NRCS. Because there has only been one such consultation in the past, it is difficult to project the number of similar activities likely in the future. It is possible that no agricultural or ranching activities will have a federal nexus, limiting the Service's involvement.
200. A likely future action that might be affected is conversion of row crops and grazing to vineyard in critical habitat Unit 3. One of the property owners in this unit has indicated his intention of converting part of his property, currently used for cattle ranching and farming, to a vineyard. He would like start this project within a year, with full production expected in three to five years. In addition, the property owner to the south, also within Unit 3, intends to convert part of his land to vineyard. This land with south-facing slopes is quite desirable for viniculture.¹⁸⁴
201. These vineyard projects have no basis to seek funding from the NRCS and thus a section 7 nexus through this avenue is unlikely. On the other hand, a vineyard conversion may be subject to CEQA. If a vineyard conversion triggers exceptions to the agriculture exemptions for earthwork contained in the Santa Barbara County's grading ordinance, then a permit would be required.¹⁸⁵ The county Planning and Development Department has stated that designating critical habitat for the thistle would make necessary a determination regarding the project's likelihood of affecting the thistle and its habitat, which would require preparation of a land use plan and quite possibly an EIR.¹⁸⁶ These landowners may also decide to prepare an HCP under Section 10 of the Act. An HCP would not be prepared for the thistle alone because it is a plant and thus there is no take prohibition under the Act, but there are many other listed species in the area such as the California tiger salamander and the California red-legged frog.
202. Another likely future action is the construction of cooling facilities or processing plants within existing agricultural fields. Construction of these facilities centralizes agribusiness operations, reducing the need to ship food to regional facilities. These facilities also help farmers address new food processing standards arising from bioterrorism concerns. While unlikely to have a federal nexus, this type of project would be subject to the requirements of CEQA. A recent example is the Rice cooling and processing facility located on farmland near Santa Maria, in close proximity to Unit 2. This project was reviewed under CEQA as part of the Uniform Rules for Agricultural Preserves and Farmland Security Zones EIR (04-EIR-08, certified 9/25/07). An Addendum to this EIR was filed in December 2007 and subsequently found to, along with the previously filed EIR, meet the requirements of CEQA.¹⁸⁷ These types of facilities are desirable in Unit 2

¹⁸⁴ Personal communication, K. Hunter and E. Vasques, November 4, 2008.

¹⁸⁵ Personal communication, J. Karamitsos, Santa Barbara County Planning and Development, November 19, 2008.

¹⁸⁶ Ibid.

¹⁸⁷ Santa Barbara County Planning Commission, 2008. Staff Report for the OSR/Rice Cooling and Processing Facility. April 25, 2008.

because of the proximity of the fields to Route 1. Over the next 20 years four to five of these projects are likely in this area.¹⁸⁸

7.3 PRE-DESIGNATION IMPACTS

203. The pre-designation period for this analysis extends from the listing of the species in 2000 to 2008. During this time period one formal consultation with the Service occurred for the Oso Flaco Creek sediment removal project, located in proposed critical habitat Unit 1. This is the only pre-designation impact.
204. Exhibit 7-3 presents total undiscounted and present value costs of pre-designation thistle management activities on public lands.

**EXHIBIT 7-3 AGRICULTURE AND RANCHING PRE-DESIGNATION ECONOMIC IMPACTS
(2000 - 2008, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)**

| UNIT | UNDISCOUNTED COST | PRESENT VALUE COST |
|------------------------------|-------------------|--------------------|
| 1: Callender-Guadalupe Dunes | \$15,000 | \$19,700 |

7.4 POST-DESIGNATION IMPACTS

205. The post-designation period for this analysis is 2009 to 2028. Post-designation impacts are categorized as either occurring in the baseline or as incremental to the proposed critical habitat designation. During the post-designation time period two vineyard conversion projects in Unit 3 and four to five agricultural cooling and/or processing facility projects in Unit 2 are expected.
206. A previous analysis evaluated whether critical habitat designation results in additional requirements and/or costs during the preparation of an EIR.¹⁸⁹ This analysis finds that critical habitat designation has a different effect on “large projects” than on “small projects.”
207. “Large projects” are those required under CEQA to submit an EIR for public review and consider project alternatives. For these projects, a lower level of CEQA review, perhaps taking the route of a negative declaration, for example, is highly unlikely. Preparation of an EIR for any such large projects will include formal consideration of all potential environmental impacts, including biological and/or habitat-related impacts, irrespective of the presence of designated critical habitat. A series of consultants who specialize in EIRs were asked whether the presence of critical habitat on the project site added to the cost of preparing the EIR and moving the EIR through public hearings as part of the project’s entitlement process. The consensus was that critical habitat designation adds no

¹⁸⁸ Personal communication, D. Swenk and L. Tamura, Urban Planning Concepts, October 30, 2008.

¹⁸⁹ The following two paragraphs follow closely from Economic & Planning Systems’ Economic Analysis of Critical Habitat Designation for the Arroyo Toad, March 2005.

measurable cost for the project applicant above what is already required to comply with CEQA.

208. “Small projects” are those that would have claimed a categorical exemption or submitted a negative declaration in the absence of designated critical habitat. These projects are required to prepare an EIR due to the potential impact to essential thistle habitat. The economic impact of the proposed rulemaking is estimated as the difference between the cost to perform an EIR and the cost to (a) perform a negative declaration or (b) apply for and receive a categorical exemption. Based on interviews conducted with biological consultations to frequently develop CEQA documents, this analysis assumes the costs to apply for and receive a categorical exemption, prepare a negative declaration, and prepare an EIR are approximately \$500, \$7,500, and \$50,000, respectively, for small projects.
209. This analysis assumes that both vineyard projects in Unit 3 would have to prepare an EIR in the absence of designated critical habitat for the thistle due to presence of the California tiger salamander. Both properties contain or are close to known breeding ponds and are considered to be occupied,^{190,191} Therefore, the cost of preparing an EIRs for these project (\$50,000) is applied to the baseline.
210. This analysis assumes that four agricultural cooling and/or processing facility projects will occur at equal intervals over the next 20 years beginning in 2009. These projects are considered “large projects” that would be required to submit an EIR for public review and consider project alternatives, regardless of designated critical habitat. Therefore, the cost of preparing future EIRs is included as a baseline cost. Exhibit 7-4 summarizes the post-designation baseline impacts.
211. For both the vineyard conversion and agricultural facility projects there may be delay costs associated with time needed for the county to consult with the Service about impacts to thistle critical habitat. The cost of this delay for the vineyard conversion projects would be equal to foregone profits from the vineyard. The cost of this delay for the agricultural facility projects would be equal to the additional cost of shipping produce to offsite facilities. These costs may be substantial, but the information to quantify them is not currently available. Delay costs may be baseline or incremental, depending on the presence of California tiger salamander or its designated critical habitat at the project sites.

¹⁹⁰ Personal communication, K. Hunter and E. Vasquez, Four Deer LLC, November 4, 2008.

¹⁹¹ Written communication. M. Elvin, Ventura Fish and Wildlife Office. December 24, 2005.

**EXHIBIT 7-4 AGRICULTURE AND RANCHING POST-DESIGNATION BASELINE ECONOMIC IMPACTS
(2009 - 2028, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)**

| UNIT | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST |
|---|----------------------|-----------------------|--------------------|
| 2: Santa Maria River-Orcutt Creek | \$200,000 | \$121,000 | \$10,700 |
| 3: Cañada de las Flores | \$100,000 | \$93,500 | \$8,240 |
| Total | \$300,000 | \$214,000 | \$18,900 |
| Note: Totals may not sum due to rounding. | | | |

CHAPTER 8 | OIL AND GAS OPERATIONS

212. This chapter considers the potential impacts to oil and gas companies operating within the proposed critical habitat as well as the management activities undertaken by these entities for conservation of the thistle and its habitat. Within the proposed habitat, active oil and gas production is limited and occurs on private lands where the only Federal nexus would be a permit from the USACE. However, permits are required at the county level for drilling of new wells, potentially triggering the CEQA review process. In addition, substantial restoration work has been conducted on behalf of the thistle in Unit 1 during the decommissioning and remediation of the Guadalupe Oil Field. Impacts to oil and gas entities are summarized in Exhibit 8-1 and discussed in detail in the proceeding sections.

**EXHIBIT 8-1 SUMMARY OF IMPACTS TO OIL AND GAS OPERATIONS
(2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)**

| UNIT | PRESENT VALUE IMPACTS | |
|--|-----------------------|------------------|
| | LOW ESTIMATE | HIGH ESTIMATE |
| Pre-Designation Impacts (2000 - 2008) | | |
| 1: Callender-Guadalupe Dunes | \$497,000 | \$497,000 |
| 2: Santa Maria River-Orcutt Creek | \$0 | \$0 |
| Total | \$497,000 | \$497,000 |
| Post-Designation Baseline Impacts (2009 - 2028) | | |
| 1: Callender-Guadalupe Dunes | \$380,000 | \$380,000 |
| 2: Santa Maria River-Orcutt Creek | \$10,000 | \$244,000 |
| Total | \$390,000 | \$623,000 |
| Post-Designation Incremental Impacts (2009 - 2028) | | |
| 1: Callender-Guadalupe Dunes | \$0 | \$0 |
| 2: Santa Maria River-Orcutt Creek | \$0 | \$0 |
| Total | \$0 | \$0 |
| Notes: Totals may not sum due to rounding. Oil and gas development in the study area is anticipated to result primarily from the reactivation of existing wells, which generally will not result in incremental impacts (note that one landowner undertakes voluntary surveys when reactivating wells which may lead to indirect impacts if thistles are found). Incremental impacts may be incurred in areas where new oil and gas exploration and production occurs, however projecting these impacts, given the uncertainty of future activity, is beyond the scope of this analysis. | | |

8.1 OIL AND GAS EXTRACTION

8.1.1 REGULATION AND PERMITTING OF OIL AND GAS ACTIVITIES IN CALIFORNIA

213. Oil and gas production in California is overseen by the Division of Oil, Gas, and Geothermal Resources (DOGGR), which is housed within the Department of Conservation (DEC). The Division oversees well drilling, operation, plugging, and abandonment, guaranteeing the protection of the State's resources throughout these processes. The State is divided into six districts of oil and gas production which are overseen by individual district offices within those areas. The proposed critical habitat falls within the Santa Maria District 3. Regulation of well development and operation is overseen by the District and State offices, but carried out at the county level. The permitting process is administered by the county in which the well is located, unless the county is not responsible for overseeing the CEQA process, in which case the district will maintain this responsibility.¹⁹² In Santa Barbara and San Luis Obispo Counties, the permitting process for oil and gas is coordinated by the county planning agencies.
214. The regulation of oil and gas wells in the proposed critical habitat depends on the status of the well and whether it is active. For example, the process for reactivating existing wells is relatively streamlined. Inactive wells which are reactivated without significant alteration to existing infrastructure (e.g., no grading or other habitat impacts) can be reactivated without a permit and do not require CEQA review.^{193,194} In order to reinitiate operation on an existing well, the landowner must submit a Notice of Intent to the County which must be approved within 10 days of submittal.¹⁹⁵
215. Unlike reactivation of existing wells, the drilling of a new well requires a permit from the County. The type of permit and associated level of effort can vary, but at least a ministerial permit is required prior to the commencement of drilling activity.¹⁹⁶ If the well is located in an area of "significant habitat", including areas designated as critical habitat for endangered species, then the County will require a preliminary biological survey of the project area.¹⁹⁷ If any endangered species are encountered during this survey, then the full CEQA process will be carried out. This process will either result in a negative declaration or a full EIR.
216. As indicated in the Chapter 3, the proposed critical habitat for thistle overlaps with critical habitat for several other endangered species, including California tiger salamander, Lompoc yerba santa, and others, which are more abundant than the rare thistle. Therefore, it is unlikely that thistle critical habitat would require additional action in and of itself. In areas where the proposed habitat overlaps with existing critical habitat

¹⁹² Personal communication, P. Abel, District 3 DOGGR, November 3, 2008.

¹⁹³ Personal communication, B. Tetley, Santa Barbara County Planning and Development, November 13, 2008.

¹⁹⁴ The well must already have a land use permit in place; any well drilled after 1980's should already have this permit (Personal communication, B. Tetley, Santa Barbara County Planning and Development, November 13, 2008).

¹⁹⁵ Personal communication, P. Abel, District 3 DOGGR, November 3, 2008.

¹⁹⁶ Personal communication, B. Tetley, Santa Barbara County Planning and Development, November 12, 2008.

¹⁹⁷ Ibid.

for other species, the costs associated with the assessment and resulting project modifications are considered baseline. However, if a well is drilled in proposed critical habitat for thistle in areas where no other critical habitat or endangered species are known to exist, then the costs of the preliminary survey and any resulting activities required should the thistle be found, would be incremental to the proposed rule.¹⁹⁸

217. The only federal landowner in the proposed critical habitat with existing oil and gas wells is Vandenberg Air Force Base. There are no known plans to tap these resources, which are currently inactive.¹⁹⁹ Since there are no federally owned lands where active oil and gas extraction is occurring within the proposed critical habitat, the only potential nexus for oil and gas activities is through a dredge and fill permit issued by the USACE. To date, there is no history of consultation regarding active oil and gas extraction specifically relating to the thistle or its current critical habitat.

8.1.2 CURRENT OIL AND GAS ACTIVITY IN PROPOSED CRITICAL HABITAT

218. According to data released by the DOGGR, there are 422 existing oil and gas wells within the boundaries of the proposed critical habitat²⁰⁰ Of these existing wells, only one, located in Unit 2, is currently operating.^{201, 202} Approximately 94 percent of the existing wells in the proposed designation have been abandoned or converted to uses other than oil or gas extraction.²⁰³
219. As shown in the Exhibit 8-2, a significant portion of existing wells fall within the bounds of public lands in Unit 1. These wells are part of the Guadalupe Oil Field which is currently being remediated and is expected to be placed under conservation easement pending completion of restoration activities.²⁰⁴ A detailed discussion of activities in Guadalupe Oil Field is included in the next section. The remaining wells, which represent less than 30 percent of the total wells in the proposed critical habitat, are located

¹⁹⁸ For the latter case to be true in areas occupied by the thistle, this analysis assumes that the private landowners in those areas are currently unaware of the potential presence of the species, and would not have conducted surveys for the plant but for the information provided by the critical habitat designation. Evidence from interviews with planning consultants suggests this is a reasonable assumption. The consultants stated that biologists conducting surveys in Unit 2 do not typically search for the thistle and were unaware that critical habitat already exists for this species in this area (Personal communication with D. Swenk and L. Tamura, Urban Planning Concepts, October 30, 2008).

¹⁹⁹ These wells could be reactivated in the future but recent inspection indicated that no disturbance would be required outside the footprint of the wells prior to reactivation. In addition, no thistle or other listed plants currently occur in this area. Therefore, these wells are not considered further in this analysis. (Written communication, L. Lum, Botanist, Vandenberg Air Force Base, November 24, 2008).

²⁰⁰ DOGGR, 2008. Wells Database, updated July 24, 2008. Accessed October 29, 2008.

http://www.conservation.ca.gov/dog/maps/Pages/goto_welllocation.aspx

²⁰¹ DOGGR, 2008. Monthly Production and Injection Databases, updated October 21, 2008. Accessed October 29, 2008.

http://www.conservation.ca.gov/dog/prod_injection_db/Pages/Index.aspx

²⁰² The analysis of active oil wells was conducted through guidance provided by J. Campion of the DOGGR on October 29, 2008. Active wells can be identified by linking the production and injection databases via AIP number, which is a unique identifier of all wells in California.

²⁰³ This estimate is based on the status code field of the wells database.

²⁰⁴ Personal communication, T. Jordan, Ecological Coordinator, Chevron Environmental Management Company, October 24, 2008.

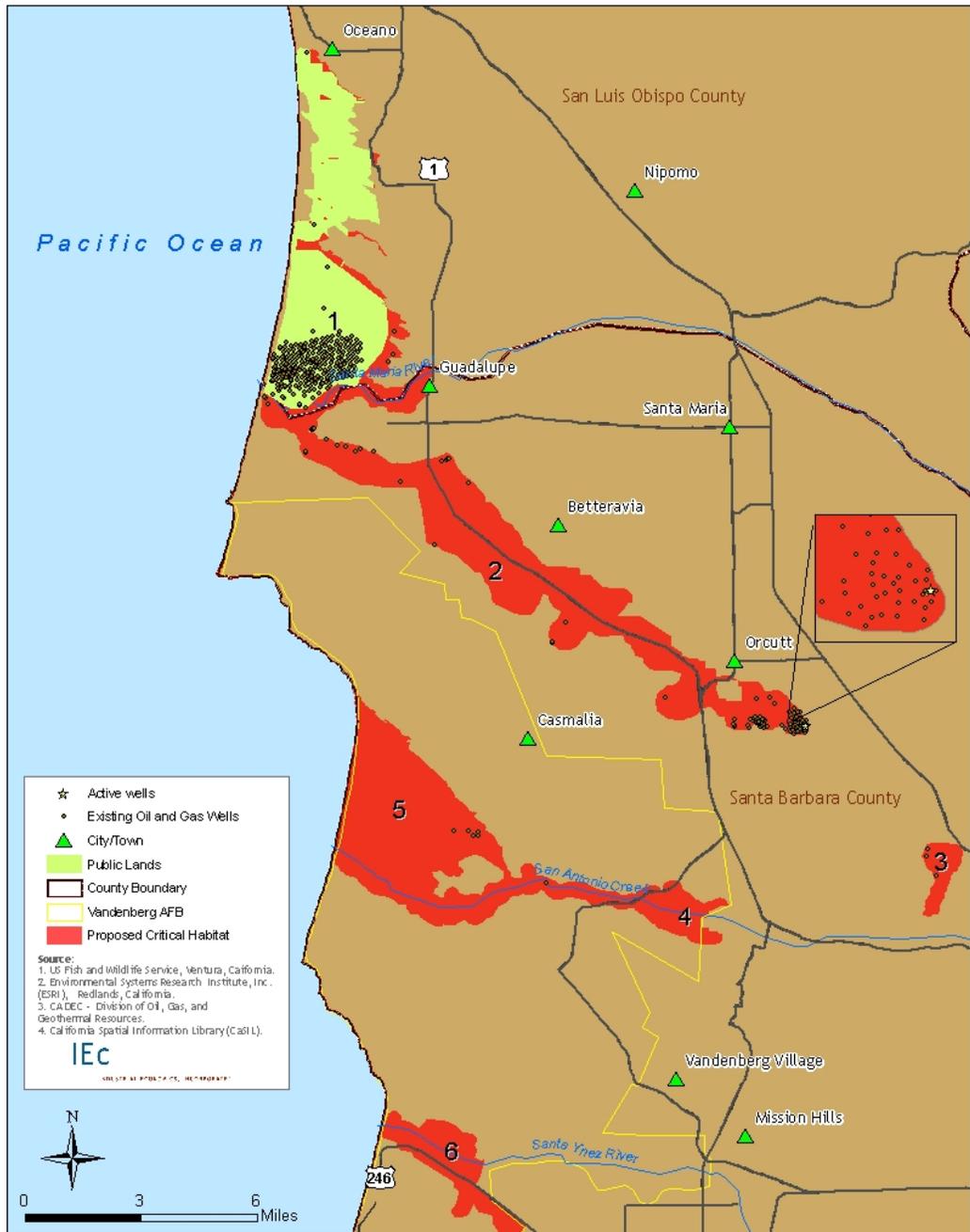
on private lands, with the exception of a small number of wells on Vandenberg Air Force Base.

220. As indicated in the preceding discussion of oil and gas regulation, there is no history of Federal involvement on privately owned lands relating to the thistle or its current critical habitat. The most likely point of regulation is via the County during the drilling of new wells, and the thistle and its critical habitat represent one of many sensitive resources considered during this process. At the same time, any predictions regarding future oil and gas activity within the proposed habitat would be speculative. While additional oil and gas activity is expected, given the surge in the price of crude oil in the past year, the nature and timing of these activities is unpredictable and reliant on complex factors which are beyond the scope of this analysis. At this time no impacts to the oil and gas sector related to drilling new wells can be estimated, and it is likely that any impacts would be baseline due to the consideration of concomitant endangered species and sensitive or critical habitats.
221. Under favorable economic conditions, the most likely first reaction to rising oil prices would be reinitiation of existing wells, rather than the establishment of new sources. For example, a private landowner in Unit 3 considered extracting oil from existing wells on his property last summer when gas prices were high, but has since relinquished this plan given the drop in prices.²⁰⁵ In Unit 2, the owner of the only active well, Breitburn Energy LLC., stated that reactivation of existing wells was highly likely, although the specific wells to be reopened and the timing of this activity were impossible to predict.²⁰⁶ Discussions with Breitburn Energy also indicate that critical habitat for the thistle could indirectly impact the company because they will now consider the thistle while conducting preliminary biological surveys prior to reactivation of existing wells. More details regarding these impacts and the methodology employed to estimate the cost to Breitburn are discussed in the next section.

²⁰⁵ Personal communication, K. Hunter and E. Vasquez, Four Deer LLC, November 4, 2008.

²⁰⁶ Personal communication, M Brock, November 13, 2008.

EXHIBIT 8-2 EXISTING AND ACTIVE OIL AND GAS WELLS IN PROPOSED CRITICAL HABITAT



Indirect impacts: Breitburn Energy LLC.

222. In addition to the well that is currently producing, Breitburn owns 49 other wells in proposed Unit 2 which are not active; of these, 23 could be reactivated given favorable economic conditions, while the remainder are coded as abandoned or converted to other uses and are therefore not considered further in this analysis.^{207,208}
223. As previously established, no permit would be required by the County for reactivation of Breitburn's wells (unless the well was first drilled prior to 1980). However, it is the company's policy to conduct biological surveys of all existing wells prior to reactivation.²⁰⁹ In the past, these assessments have indicated the presence of another endangered species, the Lompoc yerba santa, although no thistles have been identified on the property. Due to the presence of the Lompoc Yerba Santa, Breitburn consulted with the Service and was required by the County to modify its activities to reduce impacts to the plant.²¹⁰
224. The presence of other endangered species and critical habitat areas indicates that the surveys would be done regardless of the designation of critical habitat for thistle. Therefore the cost of biological surveys prior to reactivation of wells is considered a baseline cost in this analysis. In the event that thistles were identified in one of these surveys, additional project modifications could be required by the County. However, given the lack of data on the existence of the thistle, there is currently not enough information to predict the likelihood of its existence in this area. For this reason, this analysis does not attempt to predict the likelihood or cost of future project modifications related to the presence of thistle.
225. For every well that could be reactivated, a biological survey would be conducted by Breitburn in the proposed critical habitat. Since the particular wells and timing of reactivation cannot be predicted, this analysis conservatively assumes that all 23 existing wells could be reopened over the next 20 years, with the costs evenly distributed over this time period. According to Breitburn, surveys range from one and a half days of a biologist's time, or approximately \$824, up to \$20,000.²¹¹ The range is dependent on the nature of the site being surveyed. This per survey value is multiplied by the total number of wells, for estimated total present value impacts of between \$10,000 and \$240,000, assuming a seven percent discount rate. As stated previously, these impacts are considered to be baseline since they are standard operating procedure for the company

²⁰⁷ Personal communication, M. Brock, November 13, 2008. Note that this estimation is based on interpretation of status codes provided with DOGGR data but that specific data from Breitburn regarding well status is forthcoming.

²⁰⁸ [Note that there are 4 wells owned by other companies that could be reactivated but we have not been able to contact them to date; any information provided by these companies will be included in subsequent drafts.]

²⁰⁹ Personal communication, M. Brock, November 13, 2008.

²¹⁰ Ibid.

²¹¹ Ibid.

and because multiple endangered species and sensitive or critical habitat areas are considered.

8.2 DECOMMISSIONING, REMEDIATION, AND RESTORATION OF OIL FIELDS

226. Chevron is currently the only oil company conducting remediation in the proposed critical habitat for the thistle. The corporation owns the Guadalupe Oil Field which spans 2,700 acres of the Guadalupe Dune Complex. Bordered on the west by the Pacific Ocean, on the east by agricultural fields, on the north by the Guadalupe-Nipomo Dunes NWR, and the Santa Maria River to the south, the field occupies a wide swath of the coast which contains the largest block of native thistle habitat and the greatest extant population of La Graciosa thistle.²¹² Oil production here began in the 1940's and continued through 1994, when official extractive activities ceased.²¹³
227. During the productive years, diluent fluid used in the extraction process leaked into surrounding soils, contaminating sediment and groundwater. In response, the Regional Water Quality Control Board (RWQCB) issued Cleanup or Abatement Order 98-38 (CAO) in 1998, requiring removal and treatment of contaminated sediment; shortly thereafter, the County of San Luis Obispo granted a Development Permit allowing for decommissioning, remediation, and restoration of Guadalupe Oil Field.²¹⁴ The project is governed by the Multi-Agency Coordination Committee which includes these local entities, as well as the CDFG and the California Coastal Commission (CCC). All activities conducted for the thistle are considered to be baseline since they are required under State law and critical habitat designation is not expected to affect the future course of action in the Field.
228. The Federal nexus for this project originates from a 404 permit granted by the USACE for completion of the remedial work. Consultation for the Guadalupe Oil Field beach restoration with Unocal and now Chevron has been ongoing since 1999.²¹⁵ Formal consultation for the thistle was initiated in 2004; therefore this analysis assumes the cost of formal consultation was incurred in that year. The result of this consultation was a biological opinion issued in 2005 which includes several minimization measures required to reduce impacts to the thistle.²¹⁶ These activities are summarized in Exhibit 8-3 and discussed in more detail below.

²¹² 73 FR 45819; Outplanting of Marsh Sandwort and Gambel's Watercress at the Guadalupe-Nipomo Dunes National Wildlife Refuge, San Luis Obispo County, California, # 1-8-08-F-1.

²¹³ Biological and Conference Opinion for the Site-Wide Guadalupe Oil Field Remediation and Restoration Project, San Luis Obispo County, California, # 1-8-03-FC-57.

²¹⁴ Ibid.

²¹⁵ Biological Opinion for the Guadalupe Oil Field Beach Project, San Luis Obispo County, #1-8-00-F-24.

²¹⁶ Biological and Conference Opinion for the Site-Wide Guadalupe Oil Field Remediation and Restoration Project, San Luis Obispo County, California, # 1-8-03-FC-57.

EXHIBIT 8-3 SUMMARY OF THISTLE MANAGEMENT ACTIVITIES WITHIN GUADALUPE OIL FIELD

| MANAGEMENT ACTIVITY | |
|----------------------------------|--------------------------------------|
| CONSULTATION WITH SERVICE | |
| Flagging and fencing for thistle | Surveys by qualified botanist |
| Replanting | Thistle salvage & seed bank creation |
| Invasive species control | Long-term monitoring |

229. Prior to remedial or construction activities, any thistles present are salvaged and the top layer of soil containing the seedbank is preserved for future outplanting and restoration. Measures required for protection of the thistle and its habitat during construction include systematic surveys by a qualified botanist, installation of fencing to protect existing plants, and training of other personnel to be cognizant of the species and reduce impacts wherever possible.²¹⁷ There are also measures required during herbicide application to avoid negative impacts to the thistle.
230. Following the completion of remedial activities, Unocal (now Chevron) was required to restore the thistle according to guidelines approved by the CCC, CDFG, and the Service.²¹⁸ Restoration of the thistle includes a series of prioritized steps, beginning with replanting extant plants rescued during construction, followed by planting of seedlings, two for every plant lost during the project. The project will also include long-term monitoring of the thistle in restored sites and control of invasive species. The CDFG requires demonstration that outplanted thistle survive, flower, and set seed, in addition to evaluation of the restoration against predetermined success criteria.²¹⁹
231. The specific cost information for activities presented in Exhibit 8-3 could not be provided by Chevron; however, the overall cost can be estimated using the time spent on thistle-related activities by project biologists.²²⁰ Using this metric, approximately \$497,000 (seven percent discount rate, 2008\$) has been spent on the thistle relating to activities at Guadalupe Oil Field over the past 9 years.²²¹ This includes \$15,000 for formal consultation with the Service initiated in 2004. In 2008, the cost for thistle activities at

²¹⁷ Ibid.

²¹⁸ Ibid.

²¹⁹ Wetlands Restoration and Mitigation Plan, as cited in Biological Opinion # 1-8-03-FC-57.

²²⁰ It is Chevron's policy not to share financial details of remedial or restorative activities related to their operations or properties. (Personal communication, T. Jordan, Ecological Coordinator, Chevron Environmental Management Company Upstream Business Unit. October 24, 2008.)

²²¹ This is based on an estimate that the level of effort is equivalent to 5 full-time biologists over the past 15 years (only 9 of which are in the time period considered by this analysis). A biologist's time is estimated to be 2.5 times the GS-9 government rate, to integrate overhead costs of 150 percent. Only eight years (i.e. 2000-2007) of these costs are included in the analysis, concurrent with listing of the species.

the Field is expected to approximate \$36,000.²²² Work at the Field is ongoing and will likely continue over the next 10 to 25 years. Therefore, this analysis assumes that the current level of effort will continue over the next 20 years and assigns this cost evenly over those years. The estimates provided here are based on the administrative costs of thistle conservation activities within Guadalupe Oil Field; because specific costs for project activities relating to the thistle are not included, these values likely underestimate the true value of thistle conservation activities undertaken by Chevron.

232. As of February 2008, 787 individuals of *Cirsium loncholepis* have been removed from remediation areas; of these, 637 or 81 percent have been replanted and survived.²²³ In addition, there has been measurable success germinating thistles in the nursery from outplanted individuals. While it is too soon to assess the long-term survival of these replanted populations, the high success rate of restoration to date indicates that it is a viable recovery action for the thistle.²²⁴
233. Current activities are likely to continue over the next 10 to 25 years, although the time required to complete remedial and decommissioning activities is uncertain at this point. Following completion of decommissioning and remediation activities at Guadalupe Oil Field, the area is expected to be placed under conservation easement and managed by a local conservation group.²²⁵

²²² This cost is based on an estimated level of effort of 3 months of full-time work by a biologist, per year, using the same method presented in the note above.

²²³ Elvin, Mark. Recovery Outline for La Gracosa thistle Thistle, in press. February, 2008.

²²⁴ Ibid.

²²⁵ Personal communication, T. Jordan, Ecological Coordinator, Chevron Environmental Management Company Upstream Business Unit. October 24, 2008.

CHAPTER 9 | OTHER PUBLIC LANDS MANAGEMENT

234. This chapter considers potential economic impacts to public lands management in Guadalupe-Nipomo Dunes NWR and Rancho Guadalupe Dunes County Park resulting from thistle conservation activities. Efforts to protect the thistle at Vandenberg Air Force Base are discussed in Chapter 4 of this report. Economic impacts associated with CDPR's management of ODSVRA are discussed in detail in Chapter 5. Impacts associated with the Ocean Beach County Park in Unit 6 are not anticipated.
235. Guadalupe-Nipomo Dunes NWR has recently undertaken efforts to fence-off thistle plants from grazing cattle and pigs. The refuge also plans to direct visitors away from the locations of known thistle plants and place signage alerting the public to the sensitive nature of the habitat area. The refuge also surveys for the thistle in an effort to better protect the species.
236. Rancho Guadalupe Dunes County Park in Santa Barbara County has been working on a multi-species HCP since 1999.²²⁶ The HCP is still in draft form and has yet to be approved by the Service. The county expects to submit a new draft to the Service that includes the proposed critical habitat for the thistle in November 2008. This new draft HCP proposes the permanent closure of the designated critical habitat area within the park. The closure would be carried out by fencing off a 43-acre area within the park and placing signage around this area.²²⁷
237. This Chapter begins with a summary of impacts associated with efforts to protect the thistle and its habitat on non-Federal public lands is presented. Next, background information is provided on the Guadalupe-Nipomo NWR and Rancho Guadalupe Dunes County Park, followed by the presentation of pre- and post-designation impacts.

9.1 SUMMARY OF IMPACTS TO PUBLIC LANDS MANAGEMENT

238. This section presents a brief summary of pre- and post-designation impacts; details of the analysis and assumptions underlying the analysis are included in the following sections.
239. Exhibit 9-1 summarizes pre- and post-designation impacts to public lands management. The figures in Unit 1 reflect the impacts to Guadalupe-Nipomo Dunes NWR and the figures in Unit 2 reflect the impacts to Rancho Guadalupe Dunes County Park.

²²⁶ Personal communication, G. McGowan, LFR. November 13, 2008.

²²⁷ Personal communication, G. McGowan, LFR. November 6, 2008.

**EXHIBIT 9-1 SUMMARY OF IMPACTS TO PUBLIC LANDS MANAGEMENT
(2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)**

| UNIT | PRESENT VALUE IMPACTS |
|--|-----------------------|
| Pre-Designation Impacts (2000 - 2008) | |
| 1: Callender-Guadalupe Dunes | \$168,000 |
| 2: Santa Maria River-Orcutt Creek | \$112,000 |
| Total | \$280,000 |
| Post-Designation Baseline Impacts (2009 - 2028) | |
| 1: Callender-Guadalupe Dunes | \$126,000 |
| 2: Santa Maria River-Orcutt Creek | \$0 |
| Total | \$126,000 |
| Incremental Impacts (2009 - 2028) | |
| 1: Callender-Guadalupe Dunes | \$271,000 |
| 2: Santa Maria River-Orcutt Creek | \$38,300 |
| Total | \$309,000 |
| Note: Totals may not sum due to rounding. | |

9.2 BACKGROUND INFORMATION

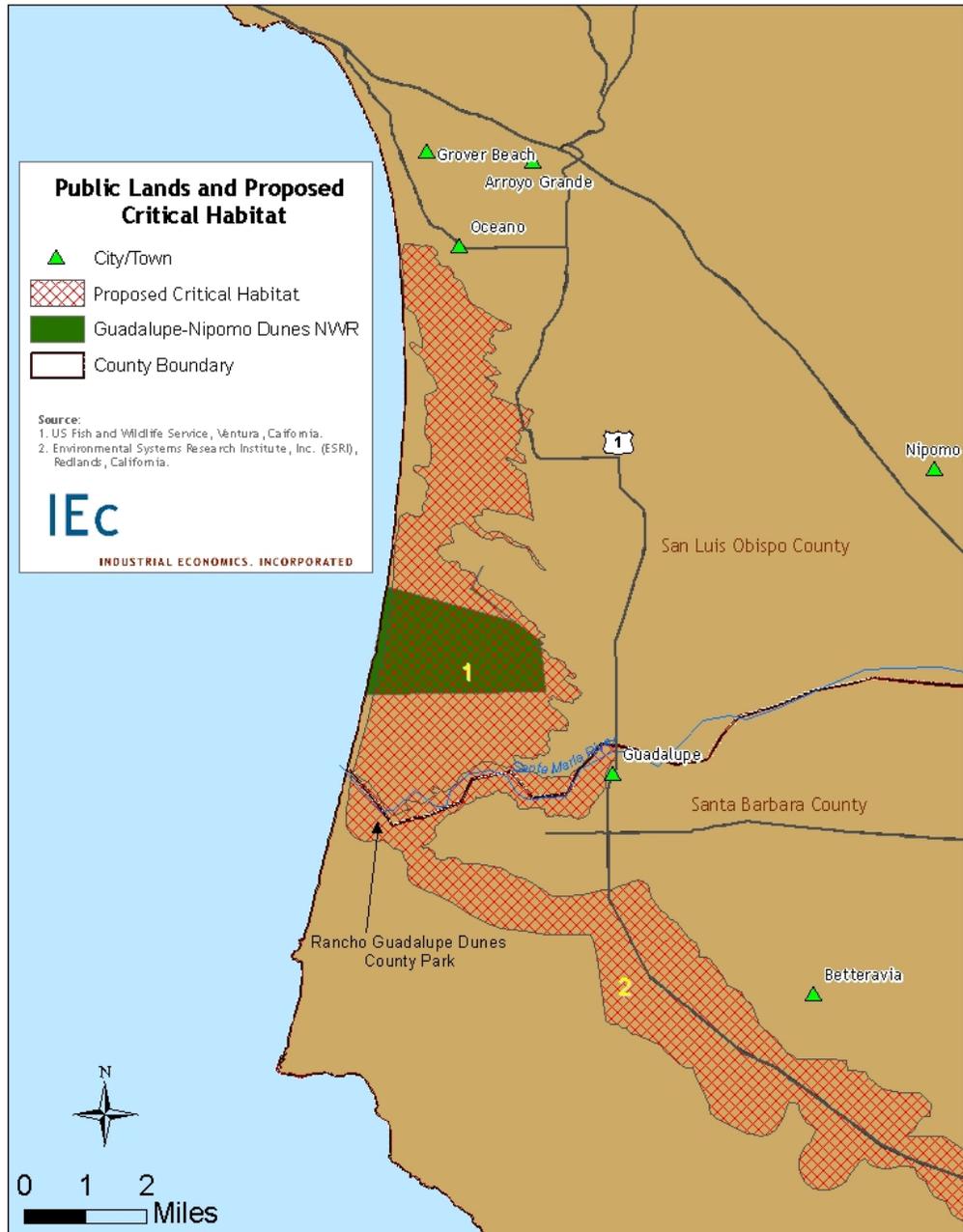
240. This section provides background information on public lands within the study area where conservation efforts for the thistle are ongoing or likely in the future. Guadalupe-Nipomo NWR is located in Unit 1 and is managed by the Service. Rancho Guadalupe Dunes County Park is located in Unit 2 and managed by the County of Santa Barbara.

9.2.1 GUADALUPE-NIPOMO NWR

241. Guadalupe-Nipomo Dunes NWR was established in 2000 and encompasses 2,553 acres northwest of the City of Guadalupe, in the heart of an 18-mile long coastal dunes complex. The refuge includes 1.8 miles of beach front and extends three miles inland. Habitats in the refuge include fore dune, open sand, back dune, coastal dune scrub, dune swale, and several wetland types. The refuge is home to more than 120 species of rare plants and animals including La Graciosa thistle, surf thistle, beach spectacle pod, giant coreopsis, California red-legged frog, western snowy plover, and California least tern. Public use opportunities in the refuge include wildlife observation, photography, surf fishing, and hiking. Vehicles, dogs, horses, and camping are all among the prohibited activities on the refuge.²²⁸ Exhibit 9-2 depicts the refuge and its relationship to the proposed critical habitat.

²²⁸ USFWS, 2008. Hopper Mountain National Wildlife Refuge, Guadalupe-Nipomo Dunes National Wildlife Refuge. Accessed October 2008. <http://www.fws.gov/hoppermountain/Guadalupe%20NDNWR/GuadalupeNipomoDunesNWR.html>

EXHIBIT 9-2 MAP OF GUADALUPE-NIPOMO DUNES NWR AND PROPOSED CRITICAL HABITAT



242. There are approximately 100 known thistle plants in the refuge. Most of the plants occur in an area of the refuge known as Three-Pond Valley.²²⁹ This is a remote area accessed via a two-hour hike from the south entrance of the refuge and a three-hour hike from the north entrance. Due to its remote location, Three-Pond Valley does not receive many visitors.²³⁰
243. Management activities in Guadalupe-Nipomo Dunes NWR include monitoring of imperiled species and habitats, habitat restoration, and control of non-native species.²³¹ Management activities for the thistle have included exclusion fencing, thistle monitoring and surveys, and exclusion of visitors from the Three-Pond Valley area. The refuge also plans to place signs informing the public of the thistle and directing them to avoid areas containing the plant.²³²
244. The most extensive management activity that has occurred thus far is the fencing of lands to deter grazing cattle and pigs. In 2007, a one and a half mile barrier fence was installed along the east side of the refuge to keep out grazing cattle. In 2008 two more fences were installed. A three mile barrier fence was constructed along the south side of the refuge to deter cattle and a perimeter fence was constructed around a population of thistle in the Three-Pond Valley area to exclude pigs and cattle. Approximately 80 of the known plants are located within the perimeter fence. It should be noted that the fences were installed to benefit other species as well, including the California red-legged frog and the Gambel's watercress.²³³
245. Other management activities conducted for conservation of the thistle include surveying refuge lands for the plant. Surveys occur on an informal basis as the refuge manager has time. In the past year approximately six to seven days have been devoted to thistle surveys.²³⁴

9.2.2 RANCHO GUADALUPE DUNES COUNTY PARK

246. Rancho Guadalupe Dunes County Park is part of the Santa Barbara County Park system. The 592-acre coastal county park is located south of Guadalupe-Nipomo Dunes NWR, just over the county border. The park is known for its miles of pristine sand dunes and many sensitive plant and animal species. Recreation activities allowed in the park include beach access, bird and whale watching, fishing, hiking, and picnicking.²³⁵

²²⁹ The refuge is considering changing the name of this area to "Thistle Valley."

²³⁰ Personal communication, G. Greenwald, Guadalupe-Nipomo Dunes NWR. October 9, 2008.

²³¹ USFWS, 2008. Hopper Mountain National Wildlife Refuge, Guadalupe-Nipomo Dunes National Wildlife Refuge. Accessed October 2008. <http://www.fws.gov/hoppermountain/Guadalupe%20NDNWR/GuadalupeNipomoDunesNWR.html>

²³² Personal communication, G. Greenwald, Guadalupe-Nipomo Dunes NWR. October 9, 2008.

²³³ Personal communication, G. Greenwald, Guadalupe-Nipomo Dunes NWR. November 13, 2008.

²³⁴ Personal communication, G. Greenwald, Guadalupe-Nipomo Dunes NWR. October 9, 2008.

²³⁵ Santa Barbara County Parks, Rancho Guadalupe Dunes Preserve, 2008. Accessed November 2008.

<http://www.sbparks.org/2007/Parks/ranchoguadalupe.html>

247. In 1999 the park began work on a multi-species HCP. The current draft HCP covers the California least tern, the western snowy plover, the California red-legged frog, and the thistle. Conservation measures for the thistle contained in the draft HCP include permanent closure of the area within the park designated as critical habitat and continued surveying for thistle. The closure would be carried out by fencing off a 43-acre portion of the park and placing signage around the fenced area.²³⁶
248. Estimates of the past costs associated with management activities for the thistle are presented in detail in section 9.3. Estimates of the expected future costs of management activities, both baseline and incremental, are presented in section 9.4.

9.3 PRE-DESIGNATION IMPACTS

249. The pre-designation period for this analysis extends from the listing of the species in 2000 to 2008. During this time period Guadalupe-Nipomo Dunes NWR made efforts to manage for the thistle by fencing-off the plants from intruding livestock, surveying the refuge area for plants, and posting signage. The refuge has also been steering the public away from the area in the refuge that has thistle plants, but this analysis assumes no welfare loss associated with this effort since so few people choose to visit this area due to its remote location.²³⁷ During the pre-designation time period Rancho Guadalupe Dunes County Park drafted a multi-species HCP that includes the thistle.
250. Exhibit 9-3 presents cost estimates for pre-designation management efforts undertaken for the thistle.

²³⁶ Personal communication, G. McGowan, LFR. November 6, 2008.

²³⁷ Personal communication, G. Greenwald, Guadalupe-Nipomo Dunes NWR. October 9, 2008.

**EXHIBIT 9-3 COST OF PRE-DESIGNATION THISTLE MANAGEMENT ACTIVITIES
(2008 DOLLARS, UNDISCOUNTED)**

| PUBLIC LAND | MANAGEMENT ACTIVITY | COST |
|---|--|--------------|
| Guadalupe-Nipomo Dunes NWR | Total East-side Fence Installation ^a | \$98,400 |
| | Materials | \$55,000 |
| | Labor ^b | \$43,400 |
| | Total South-side Fence Installation ^a | \$37,300 |
| | Materials | \$7,800 |
| | Labor ^c | \$29,500 |
| | Total Perimeter Fence Installation ^a | \$2,160 |
| | Materials | \$300 |
| | Labor ^d | \$1,860 |
| | Placement of Signs | Minimal cost |
| Guadalupe-Nipomo Dunes NWR | One-day Survey ^e | \$693 |
| Rancho Guadalupe Dunes County Park | HCP Development ^f | \$50,000 |
| Notes: | | |
| ^a Totals may not sum due to rounding. | | |
| ^b 500 hours a Los Angeles-Long Beach-Riverside, CA locality payment GS Level-11, Step 7 with 150 percent overhead (refuge manager's time and pay grade). | | |
| ^c \$1,800 for a prison labor crew plus 320 hours of government time at a Los Angeles-Long Beach-Riverside, CA locality payment GS Level-11, Step 7 with 150 percent overhead, 290 hours of volunteer labor also employed. It should be noted that this fence installation was a large effort that was made less expensive through use of surplus supplies and volunteer labor. | | |
| ^d \$300 for a labor crew plus 18 hours of government time at a Los Angeles-Long Beach-Riverside, CA locality payment GS Level-11, Step 7 with 150 percent overhead. | | |
| ^e Assumes an 8-hour day at a Los Angeles-Long Beach-Riverside, CA locality payment GS Level-11, Step 7 with 150 percent overhead. | | |
| ^f This is the estimated cost of the multi-species HCP and includes costs attributable other species. As a result, costs attributed solely to the thistle are overstated. | | |
| Source: | | |
| Personal Communication. G. Greenwald, Guadalupe-Nipomo Dunes NWR. November 13, 2008. | | |
| Personal Communication. G. McGowan, LFR. November 13, 2008. | | |

251. Guadalupe-Nipomo Dunes NWR installed the east-side fence in 2007 and the other two fences in 2008. The refuge also plans to place signs in 2008. Surveys for the thistle have taken place since the summer of 2006.²³⁸ The refuge manager indicates that on average, he surveys for the thistle six days per year.²³⁹ There was one formal consultation with the Service in 2008 involving out-planting of marsh sandwort and Gamble's watercress as well as installation of the perimeter fence. The section 7 administrative costs associated with this consultation are included in the pre-designation impacts.

²³⁸ The current refuge manager is not aware of any surveys that happened prior to his employment at the refuge. He began surveying in the summer of 2006 and the first population of thistle was found on the refuge around in the fall of 2006. Source: Personal communication, G. Greenwald, Guadalupe-Nipomo Dunes NWR. November 13, 2008.

²³⁹ Because surveying began in the summer of 2006 it is assumed that only three days of surveying occur that year. Source: Personal communication, G. Greenwald, Guadalupe-Nipomo Dunes NWR. October 9, 2008.

252. Rancho Guadalupe Dunes County Park began work on its HCP in 1999. Since this time the County has gone back and forth with the Service seeking comment on the draft HCP, then making changes approximately five times.²⁴⁰ Although consultation with the Service is ongoing (the HCP has not yet been approved by the Service), this analysis assumes that the cost of developing the HCP and the administrative costs associated with consultation are incurred upon the species' listing in 2000.
253. Exhibit 9-4 presents total undiscounted and present value costs of pre-designation thistle management activities on public lands.

**EXHIBIT 9-4 PUBLIC LANDS MANAGEMENT PRE-DESIGNATION ECONOMIC IMPACTS
(2000 - 2008, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)**

| UNIT | UNDISCOUNTED COST | PRESENT VALUE COST |
|---|-------------------|--------------------|
| 1: Callender-Guadalupe Dunes | \$161,000 | \$168,000 |
| 2: Santa Maria River-Orcutt Creek | \$65,000 | \$112,000 |
| Total | | \$280,000 |
| Note: Totals may not sum due to rounding. | | |

9.4 POST-DESIGNATION IMPACTS

254. The post-designation period for this analysis is 2009 to 2028. Post-designation impacts are categorized as either occurring in the baseline or as incremental to the proposed critical habitat designation. During this time period Guadalupe-Nipomo Dunes NWR expects to maintain the fences installed in 2008 and continue surveying the refuge for thistle. The refuge also expects to undertake approximately four projects per year that will require section 7 consultation with the Service.²⁴¹ Rancho Guadalupe Dunes County Park expects to close a 43-acre portion of the park and survey the park for thistle. To close a portion of the park from public access the park will install and maintain a fence and post signs around the area. The analysis assumes no welfare loss associated with the closure of this portion of the park because it is not an area typically used by the public.²⁴²
255. Exhibit 9-5 presents cost estimates for post-designation management efforts undertaken for the thistle.

²⁴⁰ Personal communication, G. McGowan, LFR. November 13, 2008.

²⁴¹ Personal communication, G. Greenwald, Guadalupe-Nipomo Dunes NWR. October 9, 2008.

²⁴² Personal communication, G. McGowan, LFR. November 6, 2008.

EXHIBIT 9-5 COST OF POST-DESIGNATION THISTLE MANAGEMENT ACTIVITIES
(2008 DOLLARS, UNDISCOUNTED)

| PUBLIC LAND | MANAGEMENT ACTIVITY | COST |
|--|--|--------------|
| Guadalupe-Nipomo Dunes NWR | Total Annual Fence Maintenance ^a | \$7,740 |
| | Materials | \$800 |
| | Labor ^b | \$6,940 |
| | One-day Survey ^c | \$693 |
| Rancho Guadalupe Dunes County Park | Total Fence Installation ^{a, d} | \$30,200 |
| | Materials | \$14,000 |
| | Labor | \$16,200 |
| | Placement of Signs | Minimal cost |
| | Total Annual Fence Maintenance ^{a, d} | \$1,720 |
| | Labor | \$1,540 |
| Notes: | | |
| ^a Totals may not sum due to rounding. | | |
| ^b 80 hours of government time at a Los Angeles-Long Beach-Riverside, CA locality payment GS Level-11, Step 7 with 150 percent overhead. | | |
| ^c Assumes an 8-hour day at a Los Angeles-Long Beach-Riverside, CA locality payment GS Level-11, Step 7 with 150 percent overhead. | | |
| ^d Fence installation and maintenance figures for Rancho Guadalupe Dunes County Park based on cost estimates from G. Greenwald for Guadalupe-Nipomo Dunes NWR. Used average per mile cost for NWR fencing and assumed that fencing 43 acres would require one mile of fence. | | |
| Source: Personal Communication. G. Greenwald, Guadalupe-Nipomo Dunes NWR. November 8, 2008. | | |

256. In Guadalupe-Nipomo Dunes NWR all of the management activities undertaken to protect the thistle are done on behalf of the plant. The fencing has occurred around currently known plants to protect them from livestock, the surveys are undertaken to identify thistle plants, and the signs being posted alert the public of plants in the area. Since the management activities relate to the plants and are likely to occur even if critical habitat was not designated in the refuge, these costs are considered baseline. Guadalupe-Nipomo Dunes NWR does not have a comprehensive conservation plan (CCP) and until one is in place the refuge must consult with the Service for any projects that may impact the thistle or its habitat. The refuge expects there to be four to five projects per year that require consultation. Development of the CCP is expected to begin in 2009 and continue through 2012.²⁴³ Assuming the CCP is in place and includes conservation activities for the thistle, section 7 consultation will no longer be necessary. Because the consultation record for the thistle in Guadalupe-Nipomo Dunes NWR is so minimal (only one past consultation) no consultation trends can be determined. Furthermore, no further detail on

²⁴³ Personal communication, G. Greenwald, Guadalupe-Nipomo Dunes NWR. October 9, 2008.

the nature of these projects is available. Therefore, all future consultation costs are attributed to the critical habitat designation.

257. In Rancho Guadalupe Dunes County Park, future management activities for the thistle include closure of a 43-acre portion of the park that is designated as critical habitat for the thistle. This activity would not occur in the absence of critical habitat, so the resulting cost is considered incremental.²⁴⁴ Aside from the HCP consultation, there have been no other consultations between the Refuge and the Service. In addition, once the HCP is finalized section 7 consultation will not be required. Therefore, no section 7 consultations for park activities are anticipated during the post-designation time period.

9.4.1 BASELINE IMPACTS

258. Exhibit 9-6 summarizes the post-designation baseline impacts. Surveying in the refuge is assumed to continue at a rate of six survey days per year, costing roughly \$4,160 per year. No post-designation baseline impacts are expected for Rancho Guadalupe Dunes County Park.

EXHIBIT 9-6 PUBLIC LANDS MANAGEMENT POST-DESIGNATION BASELINE ECONOMIC IMPACTS (2009 - 2028, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)

| UNIT | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST |
|---|-------------------|--------------------|-----------------|
| 1: Callender-Guadalupe Dunes | \$238,000 | \$126,000 | \$11,100 |
| 2: Santa Maria River-Orcutt Creek | \$0 | \$0 | \$0 |
| Total | | \$126,000 | \$11,100 |
| Note: Totals may not sum due to rounding. | | | |

9.4.2 INCREMENTAL IMPACTS

259. In Guadalupe-Nipomo Dunes NWR all future management activities are assumed to occur in the baseline, therefore the only incremental impacts are future administrative costs of section 7 consultation. Section 7 consultations in the refuge are assumed to occur at a rate of four per year from 2009 to 2012. After 2012, a CCP will be in place and consultations will no longer be necessary.²⁴⁵ In Rancho Guadalupe Dunes County Park the closure of 43 acres of the park is considered an impact incremental to the critical habitat designation.
260. Exhibit 9-7 presents the incremental impacts associated with public lands management. The draft HCP that includes this closure as a conservation measure was submitted to the Service in November 2008. In the past, it has taken the Service nearly two years to comment on a draft HCP.²⁴⁶ After the Service has commented and assuming that they

²⁴⁴ Personal communication, G. McGowan, LFR. November 13, 2008.

²⁴⁵ Personal communication, G. Greenwald, Guadalupe-Nipomo Dunes NWR. October 9, 2008.

²⁴⁶ Comments from the Service on the draft HCP for Rancho Guadalupe Dunes County Park dated March 2003 were submitted on December 10, 2004.

finalize the plan, it is assumed that actions will be taken immediately to close this portion of the park; therefore, it is expected that these costs will be incurred in 2011. Costs associated with maintenance of the fence begin in 2012 and continue through the end of the post-designation time period.

**EXHIBIT 9-7 PUBLIC LANDS MANAGEMENT INCREMENTAL ECONOMIC IMPACTS
(2009 - 2028, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)**

| UNIT | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST |
|---|-------------------|--------------------|-----------------|
| 1: Callender-Guadalupe Dunes | \$320,000 | \$271,000 | \$23,900 |
| 2: Santa Maria River-Orcutt Creek | \$56,400 | \$38,300 | \$3,380 |
| Total | | \$309,000 | \$27,300 |
| Note: Totals may not sum due to rounding. | | | |

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APPENDIX A | INITIAL REGULATORY FLEXIBILITY ANALYSIS AND ENERGY IMPACT ANALYSIS

1. This appendix considers the extent to which incremental impacts from critical habitat designation may be borne by small entities and the energy industry. The analysis presented in Section A.1 is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. Information for this analysis was gathered from the Small Business Administration (SBA), the Service, and from interviews with stakeholders contacted during the development of the economic analysis. The energy analysis in Section A.2 is conducted pursuant to E.O. No. 13211.
2. The analyses of impacts to small entities and the energy industry rely on the estimated *incremental* impacts resulting from the proposed critical habitat designation. The incremental impacts of the rulemaking are most relevant for the small business and energy impacts analyses because they reflect costs that may be avoided or reduced based on decisions regarding the composition of the final rule. The post-designation baseline impacts associated with the listing of the thistle and other State and local regulations and policies, as quantified in Chapters 4 through 9 of this analysis, are expected to occur regardless of the outcome of this rulemaking.

A.1 IMPACTS TO SMALL ENTITIES

3. When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an Initial Regulatory Flexibility Analysis (IRFA) that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).²⁴⁷
4. If a proposed rule is not expected to have a significant impact on a substantial number of small entities, the RFA allows an agency to so certify the rule, in lieu of preparing an IRFA.²⁴⁸ In the case of the proposed critical habitat for the thistle, uncertainty exists regarding both the numbers of entities that will be impacted by the proposed rule and the degree of impact on individual entities. In particular, uncertainty surrounds the indirect effect that the proposed rule will have on regional businesses that support OHV recreation at ODSVRA. The problem is complicated by differences among entities – even within the same sector – as to the nature and size of their operations. Therefore, to ensure a broad consideration of impact on small entities, the Service has prepared this IRFA without first making the threshold determination of whether the proposed critical

²⁴⁷ 5 U.S.C. 601 et seq.

²⁴⁸ 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).

habitat designation could be certified as not having a significant economic impact on a substantial number of small entities.

5. This IRFA is intended to improve the Service's understanding of the effects of the proposed rule on small entities and to identify opportunities to minimize these impacts in the final rulemaking. Exhibit A-1 describes the components of an IRFA. The remainder of this section addresses each of these IRFA requirements.

EXHIBIT A-1 ELEMENTS OF AN IRFA

| ELEMENTS OF AN INITIAL REGULATORY FLEXIBILITY ANALYSIS |
|--|
| 1. A description of the reasons why the action by the agency is being considered. |
| 2. A succinct statement of the objectives of, and legal basis for, the proposed. |
| 3. A description- and, where feasible, an estimate of the number- of small entities to which the rule will apply. |
| 4. A description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the types of professional skills necessary for the preparation of the report or record. |
| 5. An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap, or conflict with the proposed rule. |
| 6. A description of alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities. |
| Source: Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act. pg. 32. |

A.1.1 REASONS FOR CONSIDERING THE PROPOSED ACTION

6. Section 4(a)(3) of the Endangered Species Act (Act) requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable.²⁴⁹ Given that La Graciosa thistle is Federally-listed as endangered under the Act, the Service finds that the designation of critical habitat is required. Critical habitat was originally designated for the species on March 17, 2004.²⁵⁰ Then on March 30, 2005 the Homebuilders Association of Northern California, *et al.* filed a complaint against the Service alleging that the final rule designating critical habitat for the thistle violated the Act, APA, and NEPA. In March 2006, the Service reached a settlement to re-evaluate the 2004 critical habitat designation. On August 6, 2008, the Service published a revised proposal for critical habitat designation for the thistle.²⁵¹
7. The benefits of critical habitat designation derive from section 7 of the Act, which requires that Federal agencies, in consultation with the Service, ensure that actions they carry out, permit or fund are not likely to destroy or adversely modify critical habitat. As

²⁴⁹ 16 U.S.C. Sections 1531-1544.

²⁵⁰ 69 FR 12553.

²⁵¹ 73 FR 45806.

noted above, the Act requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable.

A.1.2 OBJECTIVES AND LEGAL BASIS OF THE PROPOSED RULE

8. The purpose of the proposed rule is to designate critical habitat for La Graciosa thistle pursuant to the Endangered Species Act (Act). Section 4(b)(2) of the Act requires that the Service designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts, of specifying any particular area as critical habitat." This section grants the Secretary [of Interior] discretion to exclude any area from critical habitat if (s)he determines "the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat". The Secretary's discretion is limited, as (s)he may not exclude areas if it "will result in the extinction of the species."

A.1.3 DESCRIPTION AND TYPES AND NUMBER OF SMALL ENTITIES TO WHICH THE RULE WILL APPLY

9. Three types of small entities are defined in the RFA:
- **Small Business** - Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently owned and operated and is not dominant in its field of operation. The U.S. Small Business Administration (SBA) has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR 121.201. The size standards are matched to North American Industry Classification System (NAICS) industries. The SBA definition of a small business applies to a firm's parent company and all affiliates as a single entity.
 - **Small Governmental Jurisdiction** - Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.
 - **Small Organization** - Section 601(4) defines a small organization as any not-for-profit enterprise that is independently owned and operated and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc.
4. The courts have held that the RFA/SBREFEA requires Federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy*

Regulatory Commission (FERC), FERC proposed regulations affecting the manner in which generating utilities incorporated construction work in progress in their rates. The generating utilities that expected to be regulated were large businesses; however, their customers -- transmitting utilities such as electric cooperatives -- included numerous small entities. In this case, the court agreed that FERC simply authorized large electric generators to pass these costs through to their transmitting and retail utility customers, and FERC could therefore certify that small entities were not directly impacted within the definition of the RFA.²⁵²

5. Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency* (EPA) addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and particulate matter.²⁵³ The basis of EPA's RFA/SBREFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of state plans that incorporated the standards. The court found that, while EPA imposed regulation on states, it did not have authority under this rule to impose regulations directly on small entities and therefore small entities were not directly impacted within the definition of the RFA.
6. The Small Business Administration (SBA) in its guidance on how to comply with the RFA recognizes that consideration of indirectly affected small entities is not required by the RFA, but encourages agencies to perform a regulatory flexibility analysis even when the impacts of its regulation are indirect.²⁵⁴ "If an agency can accomplish its statutory mission in a more cost-effective manner, the Office of Advocacy [of the SBA] believes that it is good public policy to do so. The only way an agency can determine this is if it does not certify regulations that it knows will have a significant impact on small entities even if the small entities are regulated by a delegation of authority from the federal agency to some other governing body."²⁵⁵
7. The regulatory mechanism through which critical habitat protections are enforced is section 7 of the Act, which directly regulates only those activities carried out, funded, or permitted by a Federal agency. By definition, Federal agencies are not considered small entities, although the activities they may fund or permit may be proposed or carried out by small entities. Given the SBA guidance described above, this analysis considers the extent to which this designation could potentially affect small entities, regardless of whether these entities would be directly regulated by the Service through the proposed rule or by a delegation of impact from the directly regulated entity.
8. This IRFA focuses on small entities that may bear the estimated incremental impacts associated with the proposed rulemaking as described in Chapters 4 through 9 of this

²⁵² 773 F. 2d 327 (D.C. Cir. 1985).

²⁵³ 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

²⁵⁴ Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act. pg. 20.

²⁵⁵ *Ibid.*, pg. 21.

analysis. Specifically, this economic analysis quantifies incremental economic impact of this conservation associated with Vandenberg Air Force Base, recreation, residential/commercial development, agriculture and ranching, oil and gas, and public lands management. However, as described below, only incremental impacts to recreation and agriculture/ranching are expected to affect small entities.

9. Impacts are not expected to small entities in other economic sectors potentially affected by this rule for the following reasons:
- **Vandenberg Air Force Base (Chapter 4)** – Impacts to Vandenberg Air Force Base are borne by the U.S. Air Force, which is not considered a small entity. Furthermore, there no incremental impacts to Vandenberg Air Force Base are expected.
 - **Residential/Commercial Development (Chapter 6)** – Developers in the region may include small entities, but the incremental impacts to the development sector are anticipated to be approximately \$4,850 over the next 20 years. Therefore, any potential impacts to small entities are expected to be small.
 - **Oil and Gas (Chapter 8)** – Oil and gas operators in the region may include small entities, but there are no incremental impacts expected to oil and gas industry.
 - **Public Lands Management (Chapter 9)** – Incremental impacts are expected for Guadalupe-Nipomo Dunes NWR and Rancho Guadalupe Dunes County Park. These impacts are borne by the Service and Santa Barbara County, which are not considered small entities.
10. Incremental impacts to agriculture/ranching and recreation, however, may affect small entities. A description of the types and number of small entities potentially affected follows.

Agriculture and Ranching (Chapter 7)

11. Some incremental impacts to agriculture and ranching will be borne by the agricultural industry, specifically those agricultural businesses engaged in vegetable and strawberry farming in Santa Barbara County.²⁵⁶ All future agricultural projects are expected to be located in Santa Barbara County and thus the analysis assumes that all future incremental impacts will be to businesses located in the county. Exhibit A-2 summarizes agricultural businesses located in Santa Barbara County, California. As Exhibit A-2 shows, small entities represent 55 percent of the total entities that may be impacted.

²⁵⁶ The main crops grown in the areas being considered are broccoli, cauliflower, lettuce, and strawberries. Source: Personal Communication. D. Swenk and L. Tamura, Urban Planning Concepts. October 30, 2008.

EXHIBIT A-2 TOTAL ENTITIES AND SMALL ENTITIES IN RELEVANT SECTORS OF THE AGRICULTURAL INDUSTRY

| NAICS CODE | DESCRIPTION | TOTAL NUMBER OF ENTITIES | NUMBER OF SMALL ENTITIES | PERCENT SMALL |
|--------------|---|--------------------------|--------------------------|---------------|
| 111219 | Other Vegetable (except Potato) and Melon Farming | 31 | 16 | 52% |
| 111333 | Strawberry Farming | 18 | 11 | 61% |
| TOTAL | | 49 | 27 | 55% |

Recreation (Chapter 5)

12. As described in Chapter 5, this analysis assumes recreation is limited to OHV use at the ODSVRA in San Luis Obispo County. Due to the uncertainty of management decisions with regards to how the critical habitat designation will influence OHV use at ODSVRA, this analysis presents incremental impacts using two scenarios. The lower bound incremental scenario assumes that there will be no restrictions placed on OHV use within the park and visitation levels and the regional economy will not be impacted. The upper bound incremental scenario reflects the assumption that some people who would have made a trip to ODSVRA for OHV recreation will forego future trips due to the closure of five percent of the riding area. Only the upper bound scenario is considered in this IRFA.
13. If they were to occur, conditions in the upper bound scenario may trigger both social welfare and distributional and regional economic losses. Social welfare impacts (i.e., reduced recreational opportunities for OHV users) represent a reduction in consumer surplus to individuals. Because these impacts are limited to individuals and do not include businesses, they are excluded from the IRFA. This IRFA covers only the impacts associated with the reduction in OHV-related expenditures incurred by regional businesses that support OHV recreation.
14. As Exhibit 5-6 and 5-11 illustrate, OHV-related expenditures are made in many categories including: lodging, food and beverage, private auto expenses, and retail shopping. These categories represent 82 percent of OHV-related expenditures. As discussed in Section 5.3.2, for the purposes of the regional economic impact analysis, the study area includes the Five Cities area and other areas of San Luis Obispo County, California.
15. Exhibit A-3 summarizes the number of total entities and small entities that serve OHV recreators in San Luis Obispo County. Small entities represent 85 percent of the total entities that may be impacted.

EXHIBIT A-3 INDIVIDUAL SMALL BUSINESSES SERVICING OHV USERS IN SAN LUIS OBISPO

| EXPENDITURE CATEGORY | NAICS CODE | DESCRIPTION | TOTAL NUMBER OF ENTITIES | NUMBER OF SMALL ENTITIES | PERCENT SMALL |
|--|------------|--|--------------------------|--------------------------|---------------|
| Lodging (hotel/motel/private campgrounds) | 721110 | Hotels (except Casino Hotels) and Motels | 206 | 198 | 96% |
| | 721199 | All Other Traveler Accommodation | 14 | 14 | 100% |
| | 721211 | RV (Recreational Vehicle) Parks and Campgrounds | 23 | 23 | 100% |
| | 721214 | Recreational and Vacation Camps (except Campgrounds) | 15 | 15 | 100% |
| Food & Beverage (restaurants, concessions, bars) | 445110 | Supermarkets and Other Grocery (except Convenience) Stores | 118 | 112 | 95% |
| | 445210 | Meat Markets | 16 | 16 | 100% |
| | 445220 | Fish and Seafood Markets | 1 | 1 | 100% |
| | 445230 | Fruit and Vegetable Markets | 18 | 18 | 100% |
| | 445299 | Other Specialty Food Stores | 53 | 53 | 100% |
| | 445310 | Beer, Wine, and Liquor Stores | 89 | 89 | 100% |
| | 722110 | Full-Service Restaurants | 575 | 383 | 67% |
| | 722211 | Limited-Service Restaurants | 323 | 219 | 68% |
| | 722330 | Mobile Food Services | 4 | 4 | 100% |
| Private Auto Expenses | 722410 | Drinking Places (Alcoholic Beverages) | 49 | 49 | 100% |
| | 441310 | Automotive Parts and Accessories Stores | 76 | 75 | 99% |
| | 811111 | General Automotive Repair | 190 | 190 | 100% |
| | 447190 | Other Gasoline Stations | 88 | 85 | 97% |
| Retail shopping | 453220 | Gift, Novelty and Souvenir Stores | 203 | 201 | 99% |
| Total OHV-related Industries | | | 2,061 | 1,745 | 85% |

A.1.4 DESCRIPTION OF THE PROJECTED REPORTING, RECORDKEEPING, AND OTHER COMPLIANCE REQUIREMENTS OF THE RULE

16. Small entities represent 55 and 85 percent of entities affected by the proposed critical habitat designation in agriculture/ranching and recreation, respectively. Potential impacts to these small entities are detailed below.

Agriculture and Ranching

17. Chapter 7 of the analysis discusses the potential incremental impacts of the proposed critical habitat for the thistle on agriculture and ranching. Incremental impacts to agriculture and ranching include: unquantified delay costs associated with future construction of cooling facilities and/or processing plants in Unit 2, unquantified delay

costs associated with a future vineyard conversion projects in Unit 3, and the cost of preparing an EIR for this vineyard conversion project.

18. The analysis assumes that four cooling facilities and/or processing plants will be constructed over the next 20 years. It is not possible to predict whether small entities or large entities will undertake construction of these facilities given available information. While some small entities may be affected, because agricultural facility projects are expected at a rate of 0.2 per year, fewer than one such entity is anticipated to be affected annually.

Recreation

19. As is discussed above, the IRFA covers only the impacts associated with the reduction in OHV-related expenditures incurred by regional businesses that support OHV recreation. Because these are indirect affects of the proposed critical habitat no reporting or recordkeeping is required of the impacted entities. Instead, small entities may be indirectly impacted from the closure of a portion of the ODSVRA riding area due to a loss in visitation by OHV recreators. Direct expenditures by OHV recreators who may be impacted by the closure of five percent of the riding area due to the critical habitat designation total \$5.08 million in San Luis Obispo County (as presented in Exhibit 5-11). These expenditures are then translated into total impacts to the regional economy based on the analysis of Hendricks et al. (2007) using the IMPLAN model. The potential upper-bound reduction in OHV-related economic output resulting from the proposed critical habitat is presented in Exhibit 5-12, and totals \$5.49 million for San Luis Obispo County. This IRFA further assumes that 85 percent of these impacts are borne by small businesses, based on the percentage of businesses in OHV-related sectors in the region that are small (see Exhibit A-4).
20. Applying the percentage of affected businesses within the region that are small (85 percent), the IRFA estimates that sales within OHV-related economic sectors generated by small businesses total approximately \$1.3 billion in San Luis Obispo County, as shown in Exhibit A-4. Exhibit A-4 presents the percentage of small business sales associated with impacts resulting from a loss in OHV-related expenditures at ODSVRA as a result of the critical habitat designation.

EXHIBIT A-4 REGIONAL ECONOMIC IMPACTS (UPPER BOUND) AS A PERCENTAGE OF SMALL BUSINESS SALES (2008 DOLLARS)

| UNIT | SMALL BUSINESS SALES IN OHV-RELATED SECTORS ¹ | IMPACT OF CRITICAL HABITAT ON SMALL ENTITIES ² | PERCENT OF TOTAL |
|------------------------------|--|---|------------------|
| 1: Callender-Guadalupe Dunes | \$1,260,000,000 | \$4,670,000 | 0.37% |

Notes:

(1) Small business sales in OHV-related sectors represent 85% of sales in relevant sectors based on the percentage of businesses in these sectors that are small. Sales/shipments, receipts, or revenue for available NAICS codes listed in Exhibit A-2, from 2002 Economic Census http://factfinder.census.gov/servlet/DatasetMainPageServlet?_lang=en&_program=ECN&_ds_name=E0200A1 Accessed November 2008.

(2) Total output incremental upper bound estimate of regional economic impacts. Small business impacts represent 85 percent of total regional economic impacts based on the percentage of businesses in OHV-related sectors in the region that are small businesses.

21. Exhibit A-5 estimates average sales for small businesses in OHV-related sectors, and compares this to average regional economic impacts that may result from the critical habitat designation to approximate per business impacts. Note that this per-business information represents average sales per business for the 1,745 small entities in the OHV-related sectors; actual per business sales are expected to vary across businesses. Exhibit A-6 shows that in San Luis Obispo County, regional economic impacts equal 0.37 percent of total small business sales in OHV-related economic sectors.

EXHIBIT A-5 ESTIMATES PER BUSINESS IMPACTS TO SMALL ENTITIES IN SAN LUIS OBISPO COUNTY

| NUMBER OF AFFECTED SMALL ENTITIES | SMALL BUSINESS SALES IN OHV-RELATED SECTORS ¹ | AVERAGE SALES PER SMALL ENTITY | TOTAL IMPACTS FROM CHD | AVERAGE IMPACTS PER SMALL ENTITY | AVERAGE IMPACTS AS A PERCENTAGE OF AVERAGE SALES |
|-----------------------------------|--|--------------------------------|------------------------|----------------------------------|--|
| <i>a</i> | <i>b</i> | $c = b/a$ | <i>d</i> | $e = d/a$ | $f = e/c$ |
| 1,745 | \$1,260,000,000 | \$722,000 | \$4,670,000 | \$2,680 | 0.37% |

A.1.5 IDENTIFICATION OF ALL RELEVANT FEDERAL RULES THAT MAY DUPLICATE, OVERLAP, OR CONFLICT WITH THE PROPOSED RULE

22. An IRFA must identify any duplicative, overlapping, and conflicting Federal rules. Rules are duplicative or overlapping if they are based on the same or similar reasons for the regulation, the same or similar regulatory goals, and if they regulate the same classes of industry. Rules are conflicting when they impose two conflicting regulatory requirements on the same classes of industry.
23. The protection of listed species and habitat may overlap other sections of the Act. The protections afforded to threatened and endangered species and their habitat are described

in sections 7, 9, and 10 of the Act. While the proposed critical habitat regulates activities that are Federally funded, authorized by a Federal agency, or carried out by a Federal agency, section 7 also requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. The baseline conservation efforts quantified in this report overlaps with the jeopardy standard invoked by the listing of the species. The incremental impacts forecast in this report and contemplated in this IRFA are expected to result from the critical habitat designation, however, and not other Federal rules.

A.1.6 A DESCRIPTION OF ALTERNATIVES TO THE PROPOSED RULE WHICH ACCOMPLISH THE OBJECTIVES AND WHICH MINIMIZE IMPACT ON SMALL ENTITIES

24. In the proposed rule the service identifies six units as potential critical habitat for the thistle. Section 4(b)(2) of the Act allows the Service to exclude areas proposed for designation based on economic impact and other relevant impacts. As a result, designation of a sub-set of the critical habitat, as it is defined in the proposed rule, is available to the Service as an alternative.

A.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

25. Pursuant to E.O. No. 13211, “Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,” issued May 18, 2001, Federal agencies must prepare and submit a “Statement of Energy Effects” for all “significant energy actions.” The purpose of this requirement is to ensure that all Federal agencies “appropriately weigh and consider the effects of the Federal Government’s regulations on the supply, distribution, and use of energy.”²⁵⁷
26. The Office of Management and Budget provides guidance for implementing this E.O., outlining nine outcomes that may constitute “a significant adverse effect” as compared to a scenario 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;

²⁵⁷ 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>.

- 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.²⁵⁸

27. The one criterion that may be relevant to this analysis is increases in the cost of energy production in excess of one percent. As described in Chapter 8, oil and gas development in the study area is anticipated to result primarily from the reactivation of existing wells, which generally will not result in incremental impacts. Thus, this analysis assumes no increase in the cost of energy production due to the critical habitat designation for the thistle. It should be noted that incremental impacts may be incurred in areas where new oil and gas exploration occurs, however projecting this activity, given the large number of existing wells, is beyond the scope of the analysis.

²⁵⁸ 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>.

APPENDIX B | LITERATURE REVIEW BY DR. J.R. DE SHAZO

The Effects of Closing a Portion of a Recreational Site on Visitation and Social Welfare: A Literature Review

By Dr. J.R. DeShazo
University of California at Los Angeles

1. Introduction

In order to assist with the preparation of economic analyses of critical habitat designations proposed by the U.S. Fish and Wildlife Service, this document provides a review of relevant economic research regarding demand for off-highway vehicle (OHV) recreation sites. For example, the proposed critical habitat designation of the Pierson's milk-vetch plant may result in closing a portion of the Imperial Sand Dunes Recreational Area (ISDRA) to OHVs. The purpose of this document is to summarize the economics literature as it relates to impacts that may result from closures of portions of recreation areas, in particular, OHV recreation sites. Specifically, this document reviews the literature to evaluate the effects of closing a portion of a recreation site on: 1) visitation by recreationalists and 2) welfare of recreationalists, including welfare effects of increased congestion at unclosed portions of a site.

In reviews such as this, the persuasiveness and appropriateness of the comparable studies often turn on several factors. The first issue is the mix of empirical versus theoretical analysis since empirically derived evidence is often viewed as more persuasive. This review is based primarily on an analysis of the empirical literature; however I also rely upon the theoretical recreational demand literature at times. There is considerable empirical evidence on the welfare and visitation effects associated with reducing the usable areas (quantity) of site, including the impacts of increasing on-site congestion.

A second issue arises from the fact that there are few studies of OHV recreation while there are many other relevant recreational demand analyses. Below, I discuss the reasonableness of transferring the evidence from non-OHV studies to the OHV setting. My analysis suggests several reasons for believing that the relevant results obtained for sites with non-motorized activities should hold for motorized activities.

Based on a careful review of over 25 empirical studies, I make the following observation about the current literature. First, the literature contains evidence that closing part of an actively-used site, such as the potential closure in the ISDRA, will likely result in diminished welfare per visit. This observation is based on a range of studies that present evidence on recreationalists' response to changes in the quantity of usable space at a site. Second, the literature contains numerous studies that provide evidence that an increase in on-site congestion will most likely decrease the welfare derived from that site. Given that the unclosed areas at ISDRA are likely to receive additional visitation and given the existing levels of use of the unclosed areas, one could reasonably expect the welfare of future users of these areas may decline from their current levels. Third, this review found studies that show that a reduction in the usable space is associated with a reduction of visitation to the sites (Bell, 1986; Landry, Keller and Kriesel, 2003; Shivilani, et al., 2003; Lew and Larson, 2005).

To appreciate the economic reasoning that connects declining welfare to declining visitation, in section 2, I present a conceptual framework for mapping the effects of a partial site closure on recreationalists. In Sections 3

and 4, I review several studies that assess the welfare effects of changes in the usable quantity of a site and onsite congestion. In Section 5, I consider possible caveats to my interpretations and summarize my findings.

2. A Conceptual Framework for Mapping the Effects of a Partial Site Closure

In this section, I briefly present a conceptual framework for assessing the effects of closing an actively used portion of a site. This discussion is based on the theoretical models in Braden and Kolstad (1991), Herriges and Kling (1999), Haab and McConnell (2002) and Parsons (2003).

2.1 Who is affected by a partial site closure? Clearly those recreationalists whose intended visit would have included the closed portion of the site are affected (see Chapman et al. 1998). In addition, recreationalists at the unclosed areas of the site, and at substitute sites, will likely be affected by an increase in congestion. It is important to note that while substitute sites might be some distance from the site where closures occur, users of substitute sites may also experience a loss in surplus due to increased congestion.

2.2 How might the affected recreationalists respond to a partial closure of a site? First consider those recreationalists who intended to visit the closed portion of the site. Those whose planned to visit would have included the closed portion of the site may respond in a number of ways. They may choose not to visit the affected site, either traveling to a substitute site if one exists or forgoing a recreational experience all together.

Alternatively, they may respond by still visiting the site but going exclusively to unclosed portions of the site. In all likelihood, congestion is likely to increase in the unclosed areas, unless the unclosed areas were underutilized (i.e. utilized at a level where congestion effects would not be expected) prior to the closure. If these individuals wanted to visit both the closed area and the unclosed areas, then closing that area would leave them with less quantity of the site to enjoy. Therefore, a more likely response may be for recreationalists to visit the unclosed areas but opt to spend less time in these areas because they are more congested, there is less quantity of the good to consume or they are otherwise not perfect substitutes for the closed area.

Then there are the recreationalists whose intended trip never included visiting the potentially closed area. How are these recreationalists likely to react to the increases in congestion that would accompany a partial site closing? As before, they may adjust their behavior along three dimensions. It may increase the likelihood they choose not to engage in OHV recreation at all. If they do, it may increase the likelihood that they choose a different site rather than the affected site.

2.3 What are the welfare effects associated with both the closed portion of the site and the adaptive behavior? The partial site closure may affect recreationalists' *welfare* in several specific ways. First, their welfare would decline if the recreationalists choose to forgo their preferred option of OHV recreating all together and instead engage in their second-best activity. If they choose to recreate by visiting the affected site, their welfare may decline because: 1) there is a smaller quantity of the site to enjoy, 2) the unclosed areas are more congested, 3) the unclosed areas are not perfect substitutes for the closed area²⁵⁹, 4) the closed area is a complement to the unclosed

²⁵⁹ This is true by definition since recreationalists would already be there if these areas were perfect substitutes.

areas—and thus the closing diminishes the value of those unclosed areas, or 5) they choose to spend less time on-site than they would otherwise.

If they choose to visit a substitute site instead of the affected site, their welfare is likely to decline because: 1) the substitute site maybe of a lesser quality than the affected site they would have chosen, 2) the travel price to the substitute site may be higher than that of the affected site they would have chosen, or 3) congestion at the substitute site is higher because of the closure of the affected site.

2.4. Transferring studies from non-motorized settings to motorized settings. Several of the studies that are reviewed here focus upon sites hosting non-motorized activities (e.g., beaches), while the goal of this review is to learn something about behavior at sites hosting motorized activities (e.g., OHV activities). Yet it seems reasonable to suspect that usable space is at least as important to the enjoyment of a dune-buggy recreationist on the slopes of ISDRA as that of a sunbather or a swimmer on a beach in Florida. Indeed there are several reasons to expect that motorized recreationalists might value space more and dislike congestion more. For example motorized recreational activities involve a more extensive active use of space at a site than more passive non-motorized activities. Furthermore, the effects of congestion for motorized activities may be qualitatively different and more important than for non-motorized activities. High levels of congestion for motorized activities may involve long wait times at access (staging) areas, waits for use of the track or trails, and an increased likelihood of collisions. It may be easier for motorized recreationalists to drive in a less congested area.

3. Studies of a Reduction in the Quantity of a Site Available

There are relatively few studies that analyze the before-and-after- effects of closing only a portion of a site or system of sites (Chapman et al. 1998). However, there exist many studies that value changes in the size of usable area of a site (Bell, 1986; Landry, Keller and Kriesel, 2003; Shivilani, et al., 2003; Lew and Larson, 2005). I begin with a review of studies of sites used for motorized recreation before considering other types of recreation. My review of these studies finds that reductions in the area usable for a recreational activity diminished the utility derived from a visit to that site. Among those studies that employ random utility models, this reduction in expected utility also translates into a reduction in the probability of choosing that site to visit—and thus overall visitation rates.²⁶⁰ Attachment 1 provides a table summarizing various aspects of each study mentioned below.

3.1 Changes in the quantity of sites available for motorize recreation. Jakus (2003) estimates the social value of OHV recreation in Utah, and analyzes the social impacts of proposed OHV area expansions. The study used a data set collected in 2000 by the Utah State University Institute for Outdoor Recreation and Tourism. In the paper, Jakus examines separately the effects of a decrease in wilderness, and the effects of an increase in OHV recreation area. Decreases in wilderness were found to impact welfare at \$1.56 per trip, or about 3.3% of the total value of a trip.

²⁶⁰ Random utility models provide greater information because they explicitly link the welfare derived from a site with the probability of choosing or visiting a given site. Other types of models (e.g., the Ordinary Least Squares Models used on single-site recreational demand) do not provide estimates of the change in the probability of visiting a site because of change in the usable space at a site.

Increases in OHV recreation area were found to impact welfare at about \$2.49 per trip, or about 4.5% of the total trip value.

Turning from OHV to snowmobile enthusiasts, in the *Winter 2002-2003 Visitor Survey: Yellowstone and Grand Teton National Parks*, the authors derive figures for social welfare and recreational use habits. The study simulated the welfare effects of banning all snowmobiles which is equivalent to reducing the number of miles in snowmobile trails to zero. This study finds that the total social loss from banning snowmobile access to Yellowstone National Park to be about \$70 per trip, and \$32 per trip for the Grand Teton National Park.

3.2 Beach valuation studies focused upon quantity changes. In contrast with the few studies of motorized-recreation, there are many studies (Bell, 1986; Landry, Keller and Kriesel, 2003; Shivilani, et al., 2003; Lew and Larson, 2005) that evaluate the effects of changes in beach size on the welfare of beachgoers. For example, Shivilani et al. (2003) analyze visitor preferences for beaches in South Florida. They find that, among their sample, available space was the most important aspect of a site considered when choosing a destination. Further, they find a statistically significant mean willingness to pay (WTP) of \$1.69 per visit for beach nourishment activities that would increase beach width. Similarly, Bell (1986) derives a statistically significant coefficient on square feet of beach per person.

Lew and Larson (2005) 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. They also find that sand being replaced by cobblestones during beach erosion, which they dubbed “cobblestoning,” has a negative and significant effect on WTP. Since most beach related activities take place on the sand, and cobblestoning renders patches of a site without any usable sand, the welfare effects of cobblestoning at a site might be considered similar to those of a partial site closure. While there is no numerical calculation of WTP for length, they find that the average WTP to avoid all cobblestones is \$4.25 per beach day, out of a total beach day value of \$28.27, indicating that a large sandy area may account for as much as 15% of the total consumer value of a beach day. They do not analyze the effect of changing length on visitor preferences.

Landry, Keeler and Kriesel (2003) find that the beach width coefficient is large and statistically significant. In addition, their model found that the options of a wider beach, nourishing the beach, and setting back the property lines, which would all result in more usable beach, all had positive and significant effects on social welfare. This result illustrates that total beach area is valued by consumers.

4. Studies of Welfare Effects of Congestion

Closing a site renders the usable portion of these sites smaller, increasing the levels of congestion in the unclosed portions the site. Several studies have sought to document the effects of such congestion on both the welfare of recreationalists and their propensity to visit a site. I begin by reviewing studies of motorized-activities before turning to the more general treatment of congestion in the recreational literature. Again, various aspects of these studies are summarized in Attachment 1.

4.1 Congestion at sites supporting motorized vehicles. Englin et al. (2003) explore the social value of OHV recreation for the years 1997 through 1999.²⁶¹ Data were collected from 4 OHV recreation sites in western North Carolina; Badin Lake, Brown Mountain, Upper Tellico, and Wayehutta. Per trip welfare measures from the NBII model vary from \$27.32 at Badin Lake, to \$131.58 at Wayehutta, depending on the specific site under consideration.

The *Winter 2002-2003 Visitor Survey* analyzed snowmobile recreation. This study found that decreasing crowding provided the largest increase in utility among all the possible alternatives. The report also found that “high” crowding resulted in a significantly stronger effect on utility than moderate crowding, and that crowding has a large and significant standard error, suggesting that welfare effects from crowding follow a stair step type distribution. As stated above, the *Winter 2002-2003 Visitor Survey* provides significant evidence for the negative welfare impacts of crowding on the snowmobile rider population, but no measure of welfare loss due to crowding is provided.

4.2 The effects of congestion at recreational sites. In what has become a classic article, McConnell (1977) deals most directly with the effects of congestion. McConnell (1977) finds that increased congestion reduces an individual’s consumer surplus for a beach visit. McConnell also finds that the effects of congestion vary between sites, even when site attribute variability has been accounted for. This model does not allow for substitution effects in welfare calculations, so the results from McConnell are most likely upper-bound.

Bell (1986) measures beach visitor welfare. Beach visitors were intercepted on site at Florida beaches and asked to directly state their WTP for an annual pass granting beach access. Bell finds that crowding has a negative and significant effect on social welfare when crowding is modeled as square feet of beach per person.

Anderson and Bonsor (1974) explore a demand model to explain the effects of crowding and open access on the valuation of recreational resources. For explanatory purposes, they consider a group of hypothetical ski destinations that are identical in every aspect except crowding. They show, using this hypothetical model, that crowding effects between unique sites and sites with many substitutes are dissimilar. Walsh et al. (1983) explores the welfare effects of possible expansions of skiing areas in the Colorado Rocky Mountains. Surveys depicting various levels of slope congestion and lift line wait time were administered on site during lift rides. Slope congestion was found to be negative and significant for all of the sites considered in the model. The study is able to derive a numerically significant increase in welfare from the opening of a previously closed lift, analogous to the partial restriction of a site.

Boxall et al. (2003) show that site visitors have varying WTP to avoid congestion at different points along a canoeing route. They suggest that since congestion effects may vary by activity, site, and individual, revealed preference measures of congestion effects are like “interpreting the behavior of a moving target.” They find that

²⁶¹ The main goal of the paper is to demonstrate model sensitivity to demand system restrictions. A count-data travel cost model is estimated utilizing both Poisson and National Biological Information Infrastructure (NBII) regression models, and using two different sets of restrictions on the demand equations. The study is careful to note that, since the dispersion parameter must be estimated in the NBII model, we cannot be certain that the NBII results are actually preferred.

increases in congestion are more costly than decreases are valuable, which seems to support the shifting baselines theory explored in Shelby (1980) (discussed below).²⁶²

Eugenio-Martin (2004) presents a model to analyze how changes in the probability of visiting a site changes with increases in congestion. He shows that under normal assumptions for such an analysis that each progressive unit increase in congestion has greater and greater negative impact on the probability that one would want to visit that site.

Shelby (1980) estimates the effect congestion has on visitor satisfaction using a rating system (e.g., Likert-type scale). The most interesting argument given in the paper is that visitor perceptions of crowding will vary with frequency of use, with more frequent users having much more inelastic demand for uncongested or secluded recreational experiences. This, Shelby argues, could be due to the different baseline experiences encountered by visitors on their first trip to a site. In effect, this implies that it may not be congestion, but congestion relative to previous experiences that visitors are averse to.²⁶³

5. Discussion and Conclusions

Based on a careful review of over 25 empirical studies, I make the following observation about the current literature. First, the literature contains ample evidence that closing part of an actively used site, such as the closure proposed in the ISDRA, may result in diminished welfare per visit. This observation is based on various studies. Second, I found that such a partial closure will also reduce overall levels of visitation to the site. This review found studies that show that a reduction in the usable space is associated with a reduction of visitation to the studies' sites. Third, the literature contains numerous studies that provide evidence that increases in congestion on-site, such as those that will accompany a partial site closure, may decrease the welfare derived from that site. There are diverse sets of studies that support this conclusion.

²⁶² The study also finds that congestion effects will vary along a trip route. Congestion was found to be an unambiguous good during the first and last days of a trip, but to have significant negative effects while camping along the canoe route. Presumably, people enjoyed receiving and sharing information about their trips with others at the beginning and ending of their trips but otherwise prized their solitude.

²⁶³ As a caveat to this literature, we note that while the effects of congestion are not debated, there is disagreement about whether perceived or actual crowding is more important for visitor welfare (Boxall et al. 2003; Shelby 1980). Many studies point out that user preferences for crowding are subjective and that crowding preferences should be treated as heterogeneous (Shelby 1980; Walsh et al. 1983; Boxall et al. 2003; Eugenio-Martin 2004).

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- Economic Analysis of Regulations on Snowmobile Use in the Greater Yellowstone Area, prepared for NPS
- Section 5 and Appendix E from the yet to be published IEC Canada Lynx Study

Attachment 1

| STUDY | TYPE OF ECONOMIC MODEL | LOCATION | YEAR OF DATA | DESCRIPTION OF FINDINGS |
|-----------------------------------|---|--|-----------------------|---|
| Anderson and Bonsor (1974) | Theoretical model | Hypothetical ski destinations | Not applicable | <ul style="list-style-type: none"> Find that crowding effects between unique sites and sites with many substitutes are dissimilar. |
| Bell (1986) | Semi-log ordinary least squares regression model on stated preference data | Florida beaches | 1984-1985 | <ul style="list-style-type: none"> Derives a statistically significant coefficient on square feet of beach per person. Crowding has a negative and significant effect on social welfare when modeled as square feet of beach per person. |
| Boxall et al. (2003) | A random effects probit framework | Canoeing route | 1993 | <ul style="list-style-type: none"> Find that congestion effects may vary by activity, site, and individual, thus, revealed preference measures of congestion effects are like “interpreting the behavior of a moving target.” |
| Chapman, D.J., et al. (1998) | Benefits transfer | California beaches | 1990 | <ul style="list-style-type: none"> Used benefits transfer to value lost trips to CA beaches closed due to American Trader oil spill in 1990. |
| Englin et al. (2003) | Count-data travel cost model utilizing Poisson and National Biological Information Infrastructure regression models | OHV sites in North Carolina | 1997 - 1999 | <ul style="list-style-type: none"> Study derives per person consumer surplus values for OHV use ranging from \$27 to \$132 depending on the site. |
| Eugenio-Martin (2004) | A mixed logit model | Theoretical | Simulations (no data) | Theoretical analysis. |
| Jakus (2003) | Travel cost model | OHV sites in Utah | 2000 | <ul style="list-style-type: none"> Decreases in wilderness were found to impact welfare at \$1.56 per trip. Increases in OHV recreation area were found to impact welfare at about \$2.49 per trip. |
| Landry, Keeler and Kriesel (2003) | Tandem Hedonic Property Model (HPM) and Conjoint Discrete Choice analysis | Beaches at Tybee Island, Savannah, Georgia | | <ul style="list-style-type: none"> Find that the beach width coefficient is large and statistically significant. Find that options of a wider beach, nourishing the beach, and setting back the property lines, all had positive and significant effects on social welfare. |
| Lew and | Joint labor supply | San Diego, | 2001 | <ul style="list-style-type: none"> Derive significant, positive and negative relationships respectively, |

| STUDY | TYPE OF ECONOMIC MODEL | LOCATION | YEAR OF DATA | DESCRIPTION OF FINDINGS |
|---------------------------|---|--|--------------|---|
| Larson (2005) | recreation demand (travel cost) model | California beaches | | <p>for the length of a beach site and that same length squared.</p> <ul style="list-style-type: none"> Find mean value of day at the beach is \$30/day. |
| McConnell (1977) | Ordinary Least Squares regression model | Rhode Island beaches | 1974 | <ul style="list-style-type: none"> Finds a negative and significant coefficient on the congestion term in a semi-log regression function. Effects of congestion vary between sites, even when accounting for site attribute variability. |
| RTI, International (2005) | Travel cost random utility model and a stated preference conjoint model | Yellowstone and Grand Teton National Parks | 2002 - 2003 | <ul style="list-style-type: none"> Total social loss from banning snowmobile access to Yellowstone National Park to be about \$70 per trip, and \$32 per trip for the Grand Teton National Park. Provides significant evidence for the negative welfare impacts of crowding on the snowmobile rider population. |
| Shelby (1980) | Likert scale analysis. | Backcountry recreation | 1974-1975 | <ul style="list-style-type: none"> Visitor perceptions of crowding vary with frequency of use, with more frequent users having much more inelastic demand for uncongested recreational experiences. This could be due to different baseline experiences. |
| Shivlani et al (2003) | Stated preference multinomial logit model | South Florida beaches | 1998-1999 | <ul style="list-style-type: none"> Find a statistically significant mean willingness to pay (WTP) of \$1.69 per visit for beach nourishment activities that would increase beach width |
| Walsh et al. (1983) | Step-wise Ordinary Least Squares | Colorado Rocky Mountains ski areas | 1970-1980 | <ul style="list-style-type: none"> Ski slope congestion was found to be negative and significant for all of the sites considered in the model. Derive a numerically significant increase welfare from the opening of a previously closed lift. |

APPENDIX C | THREE PERCENT DISCOUNT RATE EXHIBITS

EXHIBIT C-1 SUMMARY OF IMPACTS TO VANDENBERG AIR FORCE BASE (3% DISCOUNT RATE)

| UNIT | PRESENT VALUE IMPACTS | |
|---|-----------------------|------------------|
| | LOW ESTIMATE | HIGH ESTIMATE |
| Pre-Designation Impacts (2000 - 2008) | | |
| 4: San Antonio Creek | \$37,400 | \$55,300 |
| 5: San Antonio Terrace Dunes | \$63,300 | \$93,500 |
| 6: Santa Ynez River | \$21,400 | \$31,600 |
| Total | \$122,000 | \$180,000 |
| Post-Designation Impacts (2009 - 2028) | | |
| 4: San Antonio Creek | \$33,700 | \$64,000 |
| 5: San Antonio Terrace Dunes | \$57,000 | \$108,000 |
| 6: Santa Ynez River | \$19,300 | \$36,700 |
| Total | \$110,000 | \$209,000 |
| Note: Totals may not sum due to rounding. | | |

EXHIBIT C-2 SUMMARY OF IMPACTS TO RECREATION ACTIVITIES (3% DISCOUNT RATE)

| UNIT | PRESENT VALUE IMPACTS | |
|--|--|---------------|
| | LOWER BOUND | UPPER BOUND |
| Pre-Designation Impacts (2000 - 2008) | | |
| 1: Callender-Guadalupe Dunes | HCP development and survey costs are unavailable at this time. | |
| Post-Designation Baseline Impacts (2009 - 2028) | | |
| 1: Callender-Guadalupe Dunes | \$14,600 | \$309,000,000 |
| Incremental Impacts (2009 - 2028) | | |
| 1: Callender-Guadalupe Dunes | \$54,900 | \$55,200,000 |
| Note: Totals may not sum due to rounding. | | |

EXHIBIT C-3 PRE-DESIGNATION IMPACTS TO RECREATION ACTIVITIES (3% DISCOUNT RATE)

| UNIT | UNDISCOUNTED COST | PRESENT VALUE COST |
|------------------------------|---|--------------------|
| 1: Callender-Guadalupe Dunes | HCP development and survey costs are unavailable at this time | |

EXHIBIT C-4 POST-DESIGNATION BASELINE IMPACTS TO RECREATION ACTIVITIES (3% DISCOUNT RATE)

| UNIT | LOWER-BOUND IMPACTS | | | UPPER-BOUND IMPACTS | | |
|------------------------------|---------------------|--------------------|-----------------|---------------------|--------------------|-----------------|
| | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST |
| 1: Callender-Guadalupe Dunes | \$15,000 | \$14,600 | \$950 | \$415,000,000 | \$309,000,000 | \$20,100,000 |

EXHIBIT C-5 POST-DESIGNATION INCREMENTAL IMPACTS TO RECREATION ACTIVITIES (3% DISCOUNT RATE)

| UNIT | LOWER-BOUND IMPACTS | | | UPPER-BOUND IMPACTS | | |
|------------------------------|---------------------|--------------------|-----------------|---------------------|--------------------|-----------------|
| | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST |
| 1: Callender-Guadalupe Dunes | \$71,500 | \$54,900 | \$3,580 | \$74,200,000 | \$55,200,000 | \$3,600,000 |

EXHIBIT C-6 SUMMARY OF IMPACTS TO DEVELOPMENT ACTIVITIES (3% DISCOUNT RATE)

| UNIT | PRESENT VALUE IMPACTS | |
|--|-----------------------|---------------|
| | LOW ESTIMATE | HIGH ESTIMATE |
| Pre-Designation Impacts (2000 - 2008) | | |
| 2: Santa Maria River-Orcutt Creek | \$208,000,000 | \$208,000,000 |
| Post-Designation Baseline Impacts (2009 - 2028) | | |
| 2: Santa Maria River-Orcutt Creek | \$9,930,000 | \$9,930,000 |
| Incremental Impacts (2009 - 2028) | | |
| 2: Santa Maria River-Orcutt Creek | \$4,850 | \$4,850 |
| Note: Totals may not sum due to rounding. | | |

EXHIBIT C-7 SUMMARY OF IMPACTS TO AGRICULTURAL ACTIVITIES (3% DISCOUNT RATE)

| UNIT | PRESENT VALUE IMPACTS |
|--|------------------------------------|
| Pre-Designation Impacts (2000 - 2008) | |
| 1: Callender-Guadalupe Dunes | \$16,900 |
| Post-Designation Baseline Impacts (2009 - 2028) | |
| 2: Santa Maria River-Orcutt Creek | \$158,000 |
| 3: Cañada de las Flores | \$97,100 |
| Total | \$255,000 |
| Incremental Impacts (2009 - 2028) | |
| 2: Santa Maria River-Orcutt Creek | Potential unquantified delay costs |
| 3: Cañada de las Flores | Potential unquantified delay costs |
| Note: Totals may not sum due to rounding. | |

EXHIBIT C-8 PRE-DESIGNATION IMPACTS TO AGRICULTURAL ACTIVITIES (3% DISCOUNT RATE)

| UNIT | UNDISCOUNTED COST | PRESENT VALUE COST |
|------------------------------|-------------------|--------------------|
| 1: Callender-Guadalupe Dunes | \$15,000 | \$16,900 |

EXHIBIT C-9 POST-DESIGNATION BASELINE IMPACTS TO AGRICULTURAL ACTIVITIES (3% DISCOUNT RATE)

| UNIT | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST |
|---|-------------------|--------------------|-----------------|
| 2: Santa Maria River-Orcutt Creek | \$200,000 | \$158,000 | \$10,300 |
| 3: Cañada de las Flores | \$100,000 | \$97,100 | \$6,340 |
| Total | NA | \$255,000 | \$16,600 |
| Note: Totals may not sum due to rounding. | | | |

EXHIBIT C-10 SUMMARY OF IMPACTS TO OIL & GAS ACTIVITIES (3% DISCOUNT RATE)

| UNIT | PRESENT VALUE IMPACTS | |
|--|-----------------------|------------------|
| | LOW ESTIMATE | HIGH ESTIMATE |
| Pre-Designation Impacts (2000 - 2008) | | |
| 1: Callender-Guadalupe Dunes | \$424,000 | \$424,000 |
| Post-Designation Baseline Impacts (2009 - 2028) | | |
| 1: Callender-Guadalupe Dunes | \$533,000 | \$533,000 |
| 2: Santa Maria River-Orcutt Creek | \$14,100 | \$342,000 |
| Total | \$547,000 | \$875,000 |
| Note: Totals may not sum due to rounding. | | |

EXHIBIT C-11 SUMMARY OF IMPACTS TO PUBLIC LAND MANAGEMENT ACTIVITIES (3% DISCOUNT RATE)

| UNIT | PRESENT VALUE IMPACTS |
|--|-----------------------|
| Pre-Designation Impacts (2000 - 2008) | |
| 1: Callender-Guadalupe Dunes | \$164,000 |
| 2: Santa Maria River-Orcutt Creek | \$82,300 |
| Total | \$246,000 |
| Post-Designation Baseline Impacts (2009 - 2028) | |
| 1: Callender-Guadalupe Dunes | \$177,000 |
| Incremental Impacts (2009 - 2028) | |
| 1: Callender-Guadalupe Dunes | \$297,000 |
| 2: Santa Maria River-Orcutt Creek | \$48,300 |
| Total | \$346,000 |
| Note: Totals may not sum due to rounding. | |

EXHIBIT C-12 PRE-DESIGNATION IMPACTS TO PUBLIC LAND MANAGEMENT ACTIVITIES (3% DISCOUNT RATE)

| UNIT | UNDISCOUNTED COST | PRESENT VALUE COST |
|---|-------------------|--------------------|
| 1: Callender-Guadalupe Dunes | \$161,000 | \$164,000 |
| 2: Santa Maria River-Orcutt Creek | \$65,000 | \$82,300 |
| Total | NA | \$246,000 |
| Note: Totals may not sum due to rounding. | | |

EXHIBIT C-13 POST-DESIGNATION BASELINE IMPACTS TO PUBLIC LAND MANAGEMENT ACTIVITIES (3% DISCOUNT RATE)

| UNIT | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST |
|------------------------------|-------------------|--------------------|-----------------|
| 1: Callender-Guadalupe Dunes | \$238,000 | \$177,000 | \$11,600 |

EXHIBIT C-14 POST-DESIGNATION INCREMENTAL IMPACTS TO PUBLIC LAND MANAGEMENT ACTIVITIES (3% DISCOUNT RATE)

| UNIT | UNDISCOUNTED COST | PRESENT VALUE COST | ANNUALIZED COST |
|---|-------------------|--------------------|-----------------|
| 1: Callender-Guadalupe Dunes | \$320,000 | \$297,000 | \$19,400 |
| 2: Santa Maria River-Orcutt Creek | \$59,400 | \$48,300 | \$3,150 |
| Total | NA | \$346,000 | \$22,600 |
| Note: Totals may not sum due to rounding. | | | |

APPENDIX D | UNDISCOUNTED STREAM OF IMPACTS

EXHIBIT D-1 PRE-DESIGNATION IMPACTS TO VANDENBERG AIR FORCE BASE

| UNIT | YEAR(S) | IMPACT | | DESCRIPTION |
|------------------------------|----------|----------|--------------|------------------------|
| | | LOW | HIGH | |
| 4: San Antonio Creek | 2000 | \$373 | \$1,860 | Biological Assessments |
| | 2001 | \$388 | \$1,940 | |
| | 2002 | \$408 | \$2,040 | |
| | 2003 | \$427 | \$2,130 | |
| | 2004 | \$447 | \$2,240 | |
| | 2005 | \$464 | \$2,320 | |
| | 2006 | \$480 | \$2,400 | |
| | 2007 | \$492 | \$2,460 | |
| | 2008 | \$509 | \$2,550 | |
| | 2008 | \$8,000 | | |
| 2000, 2004, 2008 | \$7,350 | | Survey costs | |
| 5: San Antonio Terrace Dunes | 2000 | \$631 | \$3,150 | Biological Assessments |
| | 2001 | \$657 | \$3,290 | |
| | 2002 | \$691 | \$3,450 | |
| | 2003 | \$722 | \$3,610 | |
| | 2004 | \$757 | \$3,780 | |
| | 2005 | \$786 | \$3,930 | |
| | 2006 | \$812 | \$4,060 | |
| | 2007 | \$832 | \$4,160 | |
| | 2008 | \$861 | \$4,310 | |
| | 2008 | \$13,500 | | |
| 2000, 2004, 2008 | \$12,400 | | Survey costs | |
| 6: Santa Ynez River | 2000 | \$213 | \$1,070 | Biological Assessments |
| | 2001 | \$222 | \$1,110 | |
| | 2002 | \$234 | \$1,170 | |
| | 2003 | \$244 | \$1,220 | |
| | 2004 | \$256 | \$1,280 | |
| | 2005 | \$266 | \$1,330 | |
| | 2006 | \$275 | \$1,370 | |
| | 2007 | \$282 | \$1,410 | |
| | 2008 | \$291 | \$1,460 | |
| | 2008 | \$4,580 | | |
| 2000, 2004, 2008 | \$4,210 | | Survey costs | |

EXHIBIT D-2 POST-DESIGNATION BASELINE IMPACTS TO VANDENBERG AIR FORCE BASE

| UNIT | YEAR(S) | IMPACT | | DESCRIPTION |
|------------------------------|------------------------------|----------|---------|------------------------|
| | | LOW | HIGH | |
| 4: San Antonio Creek | 2009-2028 | \$509 | \$2,550 | Biological Assessments |
| | 2012, 2016, 2020, 2024, 2028 | \$7,350 | | Survey costs |
| 5: San Antonio Terrace Dunes | 2009-2028 | \$861 | \$4,310 | Biological Assessments |
| | 2012, 2016, 2020, 2024, 2028 | \$12,400 | | Survey costs |
| 6: Santa Ynez River | 2009-2028 | \$291 | \$1,460 | Biological Assessments |
| | 2012, 2016, 2020, 2024, 2028 | \$4,210 | | Survey costs |

EXHIBIT D-3 POST-DESIGNATION BASELINE IMPACTS TO RECREATION ACTIVITIES

| SUBUNIT | LOW SCENARIO | | | HIGH SCENARIO | | |
|------------------------------|--------------|----------|--------------------------------------|---------------|--------------|---------------------------------------|
| | YEAR | IMPACT | DESCRIPTION | YEAR | IMPACT | DESCRIPTION |
| 1: Callender-Guadalupe Dunes | 2009 | \$15,000 | Incorporation of LGT habitat in HCP | 2009-2028 | \$15,000 | Welfare effect of lost OHV visitation |
| | | \$0 | Administrative Costs of Consultation | 2009 | \$20,700,000 | Fence Installation |

EXHIBIT D-4 POST-DESIGNATION INCREMENTAL IMPACTS TO RECREATION ACTIVITIES

| SUBUNIT | LOW SCENARIO | | | HIGH SCENARIO | | |
|------------------------------|--------------|---------|--------------------------------------|---------------|-------------|---------------------------------------|
| | YEAR(S) | IMPACT | DESCRIPTION | YEAR(S) | IMPACT | DESCRIPTION |
| 1: Callender-Guadalupe Dunes | 2009 | \$2,500 | Incorporation of LGT habitat in HCP | 2009-2028 | \$3,710,000 | Welfare effect of lost OHV visitation |
| | | \$5,000 | Administrative Costs of Consultation | | | |
| | 2009-2028 | \$3,200 | Monitoring | 2010-2028 | \$2,500 | Incorporation of LGT habitat in HCP |
| | | | | | \$5,000 | Administrative Costs of Consultation |
| | | | | | \$5,610 | Fence Maintenance |

EXHIBIT D-5 PRE-DESIGNATION IMPACTS TO DEVELOPMENT ACTIVITIES

| UNIT | YEAR(S) | IMPACT | DESCRIPTION |
|-----------------------------------|---------|---------------|---|
| 2: Santa Maria River-Orcutt Creek | 2004 | \$185,000,000 | Mitigation Area |
| | 2008 | \$15,000 | Administrative Costs of Consultation (DJ Farms) |

EXHIBIT D-6 POST-DESIGNATION BASELINE IMPACTS TO DEVELOPMENT ACTIVITIES

| UNIT | YEAR(S) | IMPACT | DESCRIPTION |
|-----------------------------------|---------|--------------|--------------------------------------|
| 2: Santa Maria River-Orcutt Creek | 2009 | \$10,200,000 | Delay Costs |
| | | \$15,000 | Administrative Costs of Consultation |

EXHIBIT D-7 POST-DESIGNATION INCREMENTAL IMPACTS TO DEVELOPMENT ACTIVITIES

| UNIT | YEAR(S) | IMPACT | DESCRIPTION |
|-----------------------------------|---------|---------|--------------------------------------|
| 2: Santa Maria River-Orcutt Creek | 2009 | \$5,000 | Administrative Costs of Consultation |

EXHIBIT D-8 PRE-DESIGNATION IMPACTS TO AGRICULTURAL ACTIVITIES

| SUBUNIT | YEAR(S) | IMPACT | DESCRIPTION |
|------------------------------|---------|----------|-------------------------------------|
| 1: Callender-Guadalupe Dunes | 2004 | \$15,000 | Administrative Cost of Consultation |

EXHIBIT D-9 POST-DESIGNATION BASELINE IMPACTS TO AGRICULTURAL ACTIVITIES

| SUBUNIT | YEAR(S) | IMPACT | DESCRIPTION |
|-----------------------------------|------------------------|-----------|-------------|
| 2: Santa Maria River-Orcutt Creek | 2009, 2014, 2019, 2024 | \$50,000 | CEQA EIR |
| 3: Cañada de las Flores | 2009 | \$100,000 | |

EXHIBIT D-10 PRE-DESIGNATION IMPACTS TO OIL & GAS ACTIVITIES

| UNIT | YEAR(S) | IMPACT | DESCRIPTION |
|------------------------------|---------|----------|------------------|
| 1: Callender-Guadalupe Dunes | 2000 | \$35,000 | Biologists' time |
| | 2001 | \$36,400 | |
| | 2002 | \$38,300 | |
| | 2003 | \$40,100 | |
| | 2004 | \$42,000 | |
| | 2004 | \$15,000 | |
| | 2005 | \$43,600 | Biologists' time |
| | 2006 | \$45,100 | |
| | 2007 | \$46,100 | |
| | 2008 | \$35,800 | |

EXHIBIT D-11 POST-DESIGNATION BASELINE IMPACTS TO OIL & GAS ACTIVITIES

| UNIT | YEAR(S) | IMPACT | | DESCRIPTION |
|-----------------------------------|-----------|----------|----------|-------------------------------------|
| | | LOW | HIGH | |
| 1: Callender-Guadalupe Dunes | 2009-2028 | \$35,800 | | Biologists' time |
| 2: Santa Maria River-Orcutt Creek | 2009-2028 | \$948 | \$23,000 | Biological survey for existing well |

EXHIBIT D-12 PRE-DESIGNATION IMPACTS TO PUBLIC LAND MANAGEMENT ACTIVITIES

| UNIT | YEAR(S) | IMPACT | DESCRIPTION |
|-----------------------------------|------------|----------|--------------------------------------|
| 1: Callender-Guadalupe Dunes | 2006 | \$2,080 | Surveying |
| | 2007, 2008 | \$4,160 | |
| | 2007 | \$98,400 | Fencing |
| | | \$39,500 | |
| | 2008 | \$12,400 | Administrative Costs of Consultation |
| 2: Santa Maria River-Orcutt Creek | 2000 | \$50,000 | HCP Development |
| | | \$15,000 | Administrative Costs of Consultation |

EXHIBIT D-13 POST-DESIGNATION BASELINE IMPACTS TO PUBLIC LAND MANAGEMENT ACTIVITIES

| UNIT | YEAR(S) | IMPACT | DESCRIPTION |
|------------------------------|-----------|---------|-------------------|
| 1: Callender-Guadalupe Dunes | 2009-2028 | \$7,740 | Fence Maintenance |
| | | \$4,160 | Surveying |

EXHIBIT D-14 POST-DESIGNATION INCREMENTAL IMPACTS TO PUBLIC LAND MANAGEMENT ACTIVITIES

| UNIT | YEAR(S) | IMPACT | DESCRIPTION |
|-----------------------------------|-----------|----------|--------------------------------------|
| 1: Callender-Guadalupe Dunes | 2009-2012 | \$80,000 | Administrative Costs of Consultation |
| 2: Santa Maria River-Orcutt Creek | 2011 | \$30,200 | Fence Installation |
| | 2012-2028 | \$1,720 | Fence Maintenance |