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ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE PECOS SUNFLOWER

Draft Final Economic Analysis |

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EXECUTIVE SUMMARY

1. The purpose of this report is to estimate the economic impact of actions taken to protect the federally listed Pecos sunflower (*Helianthus paradoxus*) (hereafter, "sunflower") and its habitat. This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service (Service). The main text of the analysis considers all future conservation-related impacts, including impacts associated with overlapping protective measures of other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation. That is, a portion of these "co-extensive" impacts is forecast to occur regardless of critical habitat designation for the sunflower. Appendix B estimates the potential incremental impacts of critical habitat designation for the sunflower by attempting to isolate those impacts that would not be expected to occur absent the designation of critical habitat. Incremental impacts described in Appendix B and summarized in Exhibit ES-5 are those precipitated specifically by this rulemaking as proposed.

2. The Service has identified 5,745.5 acres in New Mexico and Texas as proposed critical habitat for the sunflower. Of the areas proposed for critical habitat designation, approximately 73 percent are Federally owned lands, 17 percent are state-owned lands, eight percent are privately owned, two percent are municipally owned, and less than one percent are Tribally owned.[1] The proposed area lands are generally characterized as undeveloped wetland areas.

3. Note that the Endangered Species Act of 1973, as amended (Act) does not prohibit "take" of listed plants. Section 9 of the Act does prohibit certain actions with respect to plants, including the removal of listed plants from areas under Federal jurisdiction, and damaging or destroying listed plants in knowing violation of State law. Therefore, on private lands, unless a Federal nexus is present (e.g., a landowner requires a permit from a Federal agency to undertake an activity and, therefore, that agency is subject to consultation with the Service under Section 7 of the Act), private landowners are not obligated by the Service to take actions to manage or minimize their impact on plants located on their property. As a result, the economic analysis for the sunflower does not estimate the cost of potential conservation efforts voluntarily undertaken by private landowners on private lands.[2]

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[1] This estimate is approximate because Pueblo of Laguna lands are undefined.

[2] Because of the unique relationship between Tribal governments and the U.S. government, and because it is possible that the Tribes may feel compelled, due to their history of implementing conservation efforts for endangered species as well as

4. The greatest conservation threat to the sunflower is a loss of habitat. Because it is a wetland plant species that grows in a dry part of the country, the greatest threat to its habitat is a loss of water, particularly groundwater. However, proving that water uses have a negative effect on sunflower habitat is not straightforward. Hydrological connections between water use and sunflower habitat loss are often difficult to prove. In addition, groundwater management in affected areas of Texas and New Mexico typically does not involve Federal oversight. Therefore, future impacts on water use associated with sunflower conservation efforts are assumed to be improbable. The analysis therefore focuses on other threats to sunflower habitat, including encroachment of non-native species, wetland filling and development, incompatible livestock grazing, recreational activities, and proximity to major roads. The Key Findings of the analysis are highlighted below, and Exhibit ES-1 summarizes the quantitative results of this analysis. Future coextensive impacts associated with conservation efforts for the sunflower in areas proposed for designation are forecast to be $3.9 million to $4.4 million over the next 20 years (undiscounted). The present value of these impacts is $3.3 million to $3.6 million, using a discount rate of three percent; or $2.5 million to $2.9 million, using a discount rate of seven percent. The relative magnitude of impacts to each type of affected activity is shown in Exhibits ES-2 through ES-4. Incremental impacts described in Appendix B and summarized in Exhibit ES-5 are those precipitated specifically by this rulemaking as proposed. These impacts are anticipated to be $709,000 over the next 20 years (undiscounted). The present value of these impacts is $605,000, using a discount rate of three percent, or $517,000 using a discount rate of seven percent.

their ongoing involvement with the Federal government, to undertake conservation measures for the plant, potential impacts on private Tribal lands are discussed and included in this analysis.

KEY FINDINGS

Total Impacts: Future impacts associated with conservation efforts for the sunflower in areas proposed for designation are forecast to be $3.9 million to $4.4 million over the next 20 years (undiscounted). The present value of these impacts is $3.3 million to $3.6 million, using a discount rate of three percent; or $2.5 million to $2.9 million, using a discount rate of seven percent.

Quantified Impacts: Potential impacts associated with non-native species management comprise the majority, or approximately 74 percent of the total quantified impacts in the areas proposed for designation. In summary:

- Water Withdrawal: The Service lists water withdrawal as a threat to eight subunits: 1a, 1c, 3b, 4a, 4b, 4c, 4e, and 5. Because it is a wetland plant species that grows in a dry part of the country, the greatest threat to sunflower habitat is a loss of water, particularly groundwater. At La Joya WMA (Unit 2), the sunflower appears to be thriving under current water surface management practices, however the potential exists for future water conflicts at that site. In general, however, proving that water uses have a negative effect on sunflower habitat is not straightforward. Hydrological connections between water use and sunflower habitat loss are often difficult to prove. In addition, groundwater management in affected areas of Texas and New Mexico typically does not involve Federal oversight. Therefore, future impacts on water use related to sunflower conservation efforts appear improbable. Thus, no impacts to water users are anticipated or quantified in this analysis.
- Encroachment by non-native species: A number of efforts to remove non-native species from Pecos sunflower habitat are anticipated, primarily on state-owned lands within proposed critical habitat areas. Total impacts of efforts are anticipated to be $2.4 to $2.7 million over 20 years (discounted at three percent).
- Wetland filling and development: Since the plant was listed in 1999, no section 7 consultations have taken place regarding residential or commercial development, though these activities have occurred in the vicinity of the plants since listing. The analysis includes potential costs to private landowners of parcels containing proposed critical habitat in Cibola County avoiding development activities in proposed areas, essentially reducing property values. Total potential property value losses across proposed critical habitat are $0.29 million.
- Administrative Costs: Total administrative costs associated with section 7 consultation are forecast to be $0.48 million (discounted at three percent) over 20 years.
- Incompatible Livestock Management: Only costs associated with Tribal efforts to control grazing are included in this analysis, as other private landowners are not expected to voluntarily change current practices. Efforts by the Pueblo of Acoma are anticipated to be $42,000 over 20 years (discounted at three percent) for areas proposed as critical habitat. Efforts by the Pueblo of Laguna are anticipated to be $0.2 million over 20 years (discounted at three percent) for areas proposed as critical habitat.
- Roads: Non-native species management efforts by the New Mexico Highways Department are anticipated at Blue Hole Cienega (3b) at a cost of $0.15 million (discounted at three percent). Because these efforts by NMDOT are to control non-native species, these costs are included as part of non-native species management costs.
- Recreational and Park Maintenance Activities: No Federal actions are generally involved with recreational activities in proposed critical habitat areas, and thus no impacts are anticipated. Park maintenance activities have been voluntarily changed to avoid mowing sunflower habitat.

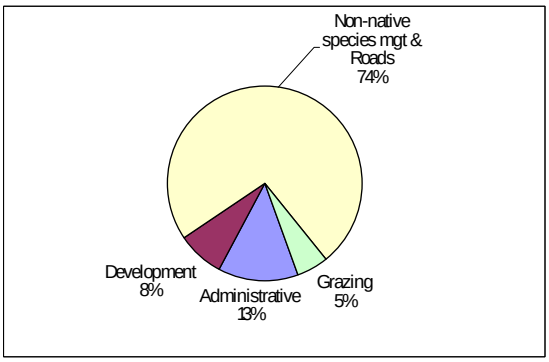
Critical Habitat Unit with Highest Impacts: Regardless of the discount rate used, the subunits with the greatest projected impacts are the Bitter Lake National Wildlife Area/City of Roswell Land (4a) and the La Joya Wildlife Management Area (2), which are the largest units by area (together constituting 75 percent of proposed lands). Impacts in these units constitute approximately 55 to 60 percent of the total estimated impacts in the areas proposed for designation.

Incremental Impacts: Incremental impacts of critical habitat designation are forecast to be $605,000 (discounted at three percent) over 20 years. These incremental impacts include additional administrative effort in considering adverse modification in section 7 consultations, property value impacts associated with wetland filling and developments, and impacts associated with Tribal land management, including livestock management efforts. All other impacts quantified in this report are baseline impacts not expected to be affected by the critical habitat rulemaking.

EXHIBIT ES-1 SUMMARY OF POTENTIAL FUTURE IMPACTS, (2007-2026)

CATEGORY	UNDISCOUNTED		3% DISCOUNT RATE		7% DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
Total Economic Impacts	$3,861,000	$4,411,000	$3,251,000	$3,642,000	$2,521,000	$2,871,000
Annualized Impacts	$193,000	$221,000	$219,000	$245,000	$238,000	$271,000

EXHIBIT ES-2 POTENTIAL FUTURE ECONOMIC IMPACTS BY ACTIVITY (DISCOUNTED AT THREE PERCENT), AREAS PROP0SED FOR CRITICAL HABITAT[3]



5. Exhibit ES-3 ranks the units proposed for critical habitat designation in order of the magnitude of expected coextensive economic impacts. Exhibit ES-4 presents more detailed information regarding present value and annualized coextensive impacts in each unit. Exhibit ES-5 presents incremental impacts of critical habitat designation for the sunflower, i.e., those impacts precipitated specifically by this rulemaking as proposed.

[3] The distribution of economic impacts by activity does not substantially change when results are undiscounted or discounted by seven percent.

EXHIBIT ES-3 SUMMARY OF FUTURE IMPACTS BY UNIT, RANKED BY MAGNITUDE OF POTENTIAL IMPACTS (2007-2026)

	UNDISCOUNTED		3% DISCOUNT RATE		7% DISCOUNT RATE	
UNIT	IMPACTS	% OF TOTAL	IMPACTS	% OF TOTAL	IMPACTS	% OF TOTAL
Bitter Lake NWR/City of Roswell Land	$1,536,000	35%	$1,142,000	31%	$814,000	28%
La Joya State Wildlife Management Area	$1,151,000	26%	$1,047,000	29%	$932,000	32%
Blue Hole Cienega/Blue Hole Fish Hatchery Ponds	$720,000	16%	$540,000	15%	$389,000	14%
Bitter Lake NWR Farm	$213,000	5%	$246,000	7%	$176,000	6%
Grants Salt Flat Wetland	$226,000	5%	$221,000	6%	$217,000	8%
Pueblo of Laguna	$225,000	5%	$169,000	5%	$122,000	4%
Rancho del Padre Spring Cienega	$159,000	4%	$141,000	4%	$126,000	4%
Lea Lake at Bottomless Lakes State Park	$40,000	1%	$30,000	1%	$21,000	1%
Oasis Dairy	$20,000	0%	$15,000	0%	$11,000	0%
Westside Spring	$20,000	0%	$15,000	0%	$11,000	0%
Dexter Cienega	$0	0%	$0	0%	$0	0%
City of Roswell Land	$0	0%	$0	0%	$0	0%
Diamond Y Spring	$0	0%	$0	0%	$0	0%
Multiple units*	$100,000	2%	$75,000	2%	$53,000	2%
TOTAL	$4,411,000	100%	$3,642,000	100%	$2,871,000	100%

Note: Totals may not add due to rounding. Impacts are high-end estimates.
Ranking of units does not substantially change when results are discounted by three and seven percent.
*Indicates that these costs will be split across more than one unit in the designation.

EXHIBIT ES-4 DETAILED FUTURE IMPACTS BY UNIT (2007 – 2026)

SUBUNIT	UNDISCOUNTED		3% DISCOUNT RATE		7% DISCOUNT RATE		ANNUALIZED, 3%		ANNUALIZED, 7%	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
Rancho del Padre Spring Cienega	$159,000	$159,000	$141,000	$141,000	$126,000	$126,000	$9,000	$9,000	$12,000	$12,000
Grants Salt Flat Wetland	$226,000	$226,000	$221,000	$221,000	$217,000	$217,000	$15,000	$15,000	$21,000	$21,000
Pueblo of Laguna	$225,000	$225,000	$169,000	$169,000	$122,000	$122,000	$11,000	$11,000	$11,000	$11,000
La Joya State Wildlife Management Area	$601,000	$1,151,000	$656,000	$1,047,000	$581,000	$932,000	$44,000	$70,000	$55,000	$88,000
Blue Hole Cienega/Blue Hole Fish Hatchery Ponds	$720,000	$720,000	$540,000	$540,000	$389,000	$389,000	$36,000	$36,000	$37,000	$37,000
Westside Spring	$20,000	$20,000	$15,000	$15,000	$11,000	$11,000	$1,000	$1,000	$1,000	$1,000
Bitter Lake NWR/City of Roswell Land	$1,536,000	$1,536,000	$1,142,000	$1,142,000	$814,000	$814,000	$77,000	$77,000	$77,000	$77,000
Bitter Lake NWR Farm	$213,000	$213,000	$246,000	$246,000	$176,000	$176,000	$17,000	$17,000	$17,000	$17,000
Oasis Dairy	$20,000	$20,000	$15,000	$15,000	$11,000	$11,000	$1,000	$1,000	$1,000	$1,000
Lea Lake at Bottomless Lakes State Park	$40,000	$40,000	$30,000	$30,000	$21,000	$21,000	$2,000	$2,000	$2,000	$2,000
Dexter Cienega	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Diamond Y Spring	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Multiple units*	$100,000	$100,000	$75,000	$75,000	$53,000	$53,000	$5,000	$5,000	$5,000	$5,000
TOTAL	**$3,861,000**	**$4,411,000**	**$3,251,000**	**$3,642,000**	**$2,521,000**	**$2,871,000**	**$219,000**	**$245,000**	**$238,000**	**$271,000**

Note: Totals may not sum due to rounding.

*Indicates that these costs will be split across more than one unit in the designation.

EXHIBIT ES-5 INCREMENTAL IMPACTS OF CRITICAL HABITAT BY UNIT

UNIT		UNDISCOUNTED	3% DISCOUNT RATE	7% DISCOUNT RATE
1a	Rancho del Padre Spring Cienega	$144,000	$130,000	$118,000
1b	Grants Salt Flat Wetland	$211,000	$210,000	$209,000
1c	Pueblo of Laguna	$5,000	$4,000	$3,000
2	La Joya State Wildlife Management Area	$10,000	$7,000	$5,000
3a	Blue Hole Cienega/Blue Hole Fish Hatchery Ponds	$5,000	$4,000	$3,000
3b	Westside Spring	$5,000	$4,000	$3,000
4a	Bitter Lake NWR/City of Roswell Land	$270,000	$202,000	$145,000
4b	Bitter Lake NWR Farm	$20,000	$15,000	$10,000
4c	Oasis Dairy	$5,000	$4,000	$3,000
4d	Lea Lake at Bottomless Lakes State Park	$10,000	$7,000	$5,000
4e	Dexter Cienega	$0	$0	$0
5	Diamond Y Spring	$0	$0	$0
	Multiple units*	$25,000	$18,000	$13,000
	TOTAL	**$709,000**	**$605,000**	**$517,000**

*Indicates that these costs will be split across more than one unit in the designation.

SECTION 1 | FRAMEWORK FOR THE ANALYSIS

6. The purpose of this report is to estimate the economic impact of actions taken to protect the federally listed Pecos sunflower (*Helianthus paradoxus*) (hereafter, "sunflower") and its habitat. It attempts to quantify the economic effects forecast to be associated with the proposed designation of critical habitat. It does so by taking into account the cost of conservation-related measures that are likely to be associated with future economic activities that may adversely affect habitat within the study area.[4] The analysis looks retrospectively at costs incurred since the sunflower was listed, and forecasts impacts likely to occur after the proposed critical habitat is finalized.

7. This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.[5] In addition, this information allows the Service to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).[6] This report also complies with direction from the U.S. Court of Appeals for the 10th Circuit that "co-extensive" effects should be included in the economic analysis to inform decision-makers regarding which areas to designate as critical habitat.[7]

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

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[4] For the purposes of this analysis, the "study area" is defined as areas proposed for critical habitat.

[5] 16 U.S.C. '1533(b)(2).

[6] Executive Order 12866, Regulatory Planning and Review, September 30, 1993; Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001; 5. U.S.C. "601 et seq; and Pub Law No. 104-121.

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

1.1 APPROACH TO ESTIMATING ECONOMIC EFFECTS

9. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the sunflower and its habitat (hereinafter referred to collectively as "sunflower conservation efforts"). Economic efficiency effects generally reflect "opportunity costs" associated with the commitment of resources required to accomplish species and habitat conservation. For example, if activities that can take place on a parcel of land are limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 of the Act represent opportunity costs of sunflower conservation efforts.

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

1.1.1 EFFICIENCY EFFECTS

11. At the guidance of the Office of Management and Budget (OMB) and in compliance with Executive Order 12866 "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect sunflower 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.[8]

12. 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 Federal land 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

[8] 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.

quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price -- the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.

13. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, a designation that precludes the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market.

14. This analysis begins by measuring impacts associated with efforts undertaken to protect sunflower 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.

1.1.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

15. 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.[9] 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.

[9] 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.

Calculating Present Value and Annualized Impacts

For each land use activity, this analysis presents economic impacts incurred in different time periods in present value terms. The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in today's dollars. Translation of the economic impacts of past or future impacts to present value terms requires the following: a) past or projected future impacts of sunflower conservation efforts; and b) the specific years in which these impacts have been or are expected to be incurred. With these data, the present value of the past or future stream of impacts (PV_c) of conservation efforts from year t to T is measured in 2007 dollars according to the following standard formula:[a]

$$PV_c = \sum_{t=t_0}^{t=T} \frac{C_t}{(1+r)^{t-2007}}$$

C_t = cost of conservation efforts in year t

r = discount rate[b]

Impacts of conservation efforts for each land use activity in each unit are also expressed as annualized values (i.e., the series of equal annual costs over some defined time period that have the same present value as estimated total impacts). Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods (T). This analysis, other than land use value impacts, employs a forecast period of 20 years, 2007 through 2026.[c] Annualized impacts of future conservation efforts (APV_c) are calculated using the following standard formula:

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

N = number of years in the forecast period

[a] To derive the present value of pre-designation conservation efforts for this analysis, t is 1999 and T is 2006; to derive the present value of post-designation conservation efforts, t is 2007 and T is 2026.

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

[c] Land value impacts associated with restrictions on development are calculated assuming future use of the land for development purposes is precluded (the land may retain value for other purposes). While calculated applying a perpetuity, this estimate reflects an impact on land value expected to be experienced at the time the rule is finalized.

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

16. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the Regulatory Flexibility Act, might be affected by future sunflower conservation efforts.[10] In addition, in response to Executive Order 13211 "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future impacts of conservation efforts on the energy industry and its customers.[11]

Regional Economic Effects

17. 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.

18. The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.

19. 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.

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[10] 5 U.S.C. ' 601 et seq.

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

1.2 SCOPE OF THE ANALYSIS

20. 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, minimize, or compensate for such threats within the boundaries of the study area. In instances where critical habitat is being proposed after a species is listed, some future impacts may be unavoidable, regardless of the final designation and exclusions under 4(b)(2). However, due to the difficulty in making a credible distinction between listing and critical habitat effects within critical habitat boundaries, this analysis considers all future conservation-related impacts to be co-extensive with the designation.[12]

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

1.2.1 SECTIONS OF THE ACT RELEVANT TO THE ANALYSIS

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

- Section 4 of the Act focuses on the listing and recovery of endangered and threatened species, as well as critical habitat designation. In this section, the Secretary is required to list species as endangered or threatened "solely on the basis of the best available scientific and commercial data."[13] Section 4 also requires the Secretary to designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat."[14]
- Section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. The administrative costs of these consultations, along with the costs of project modifications resulting from

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

[13] 16 U.S.C. 1533.

[14] Ibid.

these consultations, represent compliance costs associated with the listing of the species and proposed critical habitat.

- 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."[15] The Act does not specifically prohibit "take" of endangered plants unless the plants are under Federal jurisdiction or the action is otherwise in violation of state law.[16] The economic impacts associated with this section manifest themselves in sections 7 and 10.
- Under section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for a federally 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.[17] However, federally listed plant species may also be covered under an HCP developed for animal species. The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately minimized and mitigated. The designation of critical habitat does not require completion of an HCP; however, the designation may influence conservation measures provided under HCPs.

23. As stated above, the Act does not specifically prohibit "take" of endangered plants unless the plants are under Federal jurisdiction or the action is otherwise in violation of state law. Therefore, on private lands, unless a Federal nexus is present (e.g., a landowner requires a permit from a Federal agency to undertake an activity and, therefore, that agency is subject to consultation with the Service under Section 7 of the Act), private landowners are not obligated by the Service to take actions to manage or minimize their impact on plants located on their property. As a result, the economic analysis for the sunflower does not estimate the cost of potential conservation efforts voluntarily undertaken by private landowners on private lands.

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[15] 16 U.S.C. 1538(1).

[16] With regard to plant species, the Act states that it is unlawful to: (A) import any such species into, or export any such species from, the United States; (B) remove and reduce to possession any such species from areas under Federal jurisdiction; maliciously damage or destroy any such species on any such area; or remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any law or regulation of any State or in the course of any violation of a State criminal trespass law; (C) deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever and in the course of a commercial activity, any such species; (D) sell or offer for sale in interstate or foreign commerce any such species; or (E) violate any regulation pertaining to such species or to any threatened species of plants listed pursuant to section 4 of this Act and promulgated by the Secretary pursuant to authority provided by this Act. 16 U.S.C. 1538(2).

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

1.2.2 OTHER RELEVANT PROTECTION EFFORTS

24. 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. For the purpose of this analysis, such protective efforts are considered to be co-extensive with the protection offered by critical habitat, and costs associated with these efforts are included in this report. In addition, under certain circumstances, critical habitat may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these costs would not have been triggered absent the designation of critical habitat, they are included in this economic analysis.

1.2.3 ADDITIONAL ANALYTIC CONSIDERATIONS

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

Time Delay and Regulatory Uncertainty Impacts

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

Stigma Impacts

27. Stigma refers to the change in economic value of a particular project or activity due to negative (or positive) perceptions of the role critical habitat will play in developing, implementing, or conducting that policy. For example, changes to private property values associated with public attitudes about the limits and costs of implementing a project in critical habitat are known as "stigma" impacts. This analysis does not quantify any stigma impacts associated with the proposed critical habitat designation for the sunflower.

1.2.4 BENEFITS

28. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.[18] 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.[19]

29. 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

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

[19] 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.

literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.[20] *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.*

30. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.

31. 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. Ancillary benefits that affect markets are not anticipated in this case and, therefore, are not quantified.

1.2.5 GEOGRAPHIC SCOPE OF THE ANALYSIS

32. The geographic scope of the analysis includes areas proposed for critical habitat, which is referred to as the "study area" for the purposes of this analysis. Section 2 presents maps showing the locations of the subunits.

1.3 ANALYTIC TIME FRAME

33. 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 1999 (year of the species' final listing) to 2026 (20 years from the expected year of final critical habitat designation). Estimated impacts are divided into past (1999-2006) and future (2007-2026) impacts. Where information is available to reliably forecast economic activity beyond the 20-year time frame, this analysis incorporates that information.

[20] Ibid.

1.4 INFORMATION SOURCES

34. The primary sources of information for this report were communications with and data provided by personnel from the Service, Federal action agencies, affected private parties, state, and municipal agencies. Specifically, the analysis relies on data collected in communication with personnel from the following entities:

- Private landowners, including the Nature Conservancy;
- City of Santa Rosa;
- Pueblo of Laguna;
- Pueblo of Acoma;
- Chaves County Government;
- Cibola County Government;
- New Mexico Department of Game and Fish;
- Texas Parks and Wildlife Department;
- New Mexico State Highway and Transportation Department;
- New Mexico Department of Energy, Minerals, and Natural Resources Department: Forestry and State Parks Divisions;
- U.S. Forest Service;
- U.S. Army Corps of Engineers; and
- U.S. Fish and Wildlife Service.

35. In addition, this analysis relies upon the Service's Section 7 consultation records, as well as public comments and published data sources.

1.5 STRUCTURE OF REPORT

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

- Section 2: Background;
- Section 3: Economic Impacts;
- References;
- Appendix A: Administrative Consultation Costs; and
- Appendix B: Incremental Analysis of Critical Habitat Designation;
- Appendix C: Small Business and Energy Impacts Analysis.

SECTION 2 | BACKGROUND

37. This section summarizes the study area and provides information on the land uses and activities considered in this analysis. The Pecos sunflower is a plant that grows on permanently wet, alkaline soils at spring seeps, wet meadows, stream courses, and pond margins. The Proposed Rule describes the species and its habitat in detail.[21]

2.1 PROPOSED CRITICAL HABITAT DESIGNATION

38. The Service has identified 5,745.5 acres in New Mexico and Texas as proposed critical habitat for the sunflower.

39. Of the areas proposed for critical habitat designation (described in Exhibit 2-1), approximately 73 percent are Federally owned lands, 17 percent are state-owned lands, eight percent are privately owned, two percent are municipally owned, and less than one percent are Tribally owned.[22] The study area lands are generally characterized as undeveloped wetland areas. Exhibits 2-4 through 2-12 present an overview and aerial imagery of critical habitat areas.

[21] U.S. Fish and Wildlife Service, 50 CFR Part 17, Proposed Designation of Critical Habitat for the Pecos Sunflower (*Helianthus paradoxus*); Proposed Rule. March 27, 2007.

[22] This estimate is approximate because Pueblo of Laguna lands are undefined.

EXHIBIT 2-1 AREAS PROPOSED FOR CRITICAL HABITAT DESIGNATION

UNIT	NAME	LANDOWNER (ACRES)					TOTAL UNIT AREA (ACRES)[1]
		Federal	Tribal	State	City	Private	
1a	Rancho del Padre Spring Cienega		2.9			22.6	25.5
1b	Grants Salt Flat Wetland					62.5	62.5
1c	Pueblo of Laguna		Undefined				Undefined
2	La Joya State Wildlife Management Area			854.3			854.3
3a	Blue Hole Cienega/Blue Hole Fish Hatchery Ponds			127.6	6.3		133.9
3b	Westside Spring					6.4	6.4
4a	Bitter Lake NWR/City of Roswell Land	3,480			92.2		3,572.2
4b	Bitter Lake NWR Farm	686.2					686.2
4c	Oasis Dairy					103.9	103.9
4d	Lea Lake at Bottomless Lakes State Park			19.5			19.5
4e	Dexter Cienega					41.5	41.5
5	Diamond Y Spring					239.7	239.7
Total		4,166	2.9	1,001.4	98.5	476.6	5,745.5*
Percent		73%	0.1%	17.4%	1.7%	8.3%	100.0%

*Totals are estimated because Laguna lands are undefined.

2.2 THREATS TO THE SUNFLOWER AND ITS HABITAT

40. The Proposed Rule states that "the loss or alternation of wetland habitat continues to be the main threat to [the sunflower]." More specifically, the Proposed Rule identifies the following activities as potential threats to the sunflower and its habitat:

- Water withdrawal;
- Wetland filling and development, including the filling of ponds;
- Incompatible livestock management;[23]
- Encroachment by nonnative vegetation;
- Recreation use/campgrounds and human trampling;
- Mowing to edges of ponds; and
- Proximity to a major road.

[23] The Proposed Rule states that "well-managed grazing during non-flowering months may have a beneficial effect on *H. paradoxus* populations by decreasing the density and biomass of potentially competing plant species….Actions that remove shading grass cover, such as grazing, appear to enhance growth and reproduction of sunflower plants that are later protected from grazing while they are reproductively maturing. Therefore, properly managed livestock grazing is not incompatible with *H. paradoxus* conservation."

41. Each of the above land use activities is examined in this report to determine how it may be modified to mitigate, compensate for, or avoid threats to the sunflower and its habitat in this analysis. The threats to each unit, as identified by the Service in the Proposed Rule and Notice of Availability, are summarized in Exhibit 2-3.

EXHIBIT 2-3 THREATS TO AREAS PROPOSED FOR CRITICAL HABITAT

UNIT	NAME	WATER WITHDRAWAL	WETLAND FILLING AND DEVELOPMENT	INCOMPATIBLE LIVESTOCK MANAGEMENT	ENCROACHMENT BY NON-NATIVE VEGETATION	RECREATIONAL USE, MANAGEMENT	PROXIMITY TO A MAJOR ROAD
1a	Rancho del Padre Spring Cienega	X	X	X			
1b	Grants Salt Flat Wetland		X	X	X		
1c	Pueblo of Laguna	X		X	X		
2	La Joya State WMA				X		
3a	Blue Hole Cienega/Blue Hole Fish Hatchery Ponds		X		X	X	X
3b	Westside Spring	X	X		X		X
4a	City of Roswell Land/Bitter Lake NWR	X	X	X			
4b	Bitter Lake NWR Farm	X					
4c	Oasis Dairy	X	X	X			
4d	Lea Lake as Bottomless Lakes State Park				X	X	
4e	Dexter Cienega	X	X	X			
5	Diamond Y Spring	X	X	X			

Source: Proposed Rule and Notice of Availability.

EXHIBIT 2-4 OVERVIEW OF AREAS PROPOSED FOR CRITICAL HABITAT

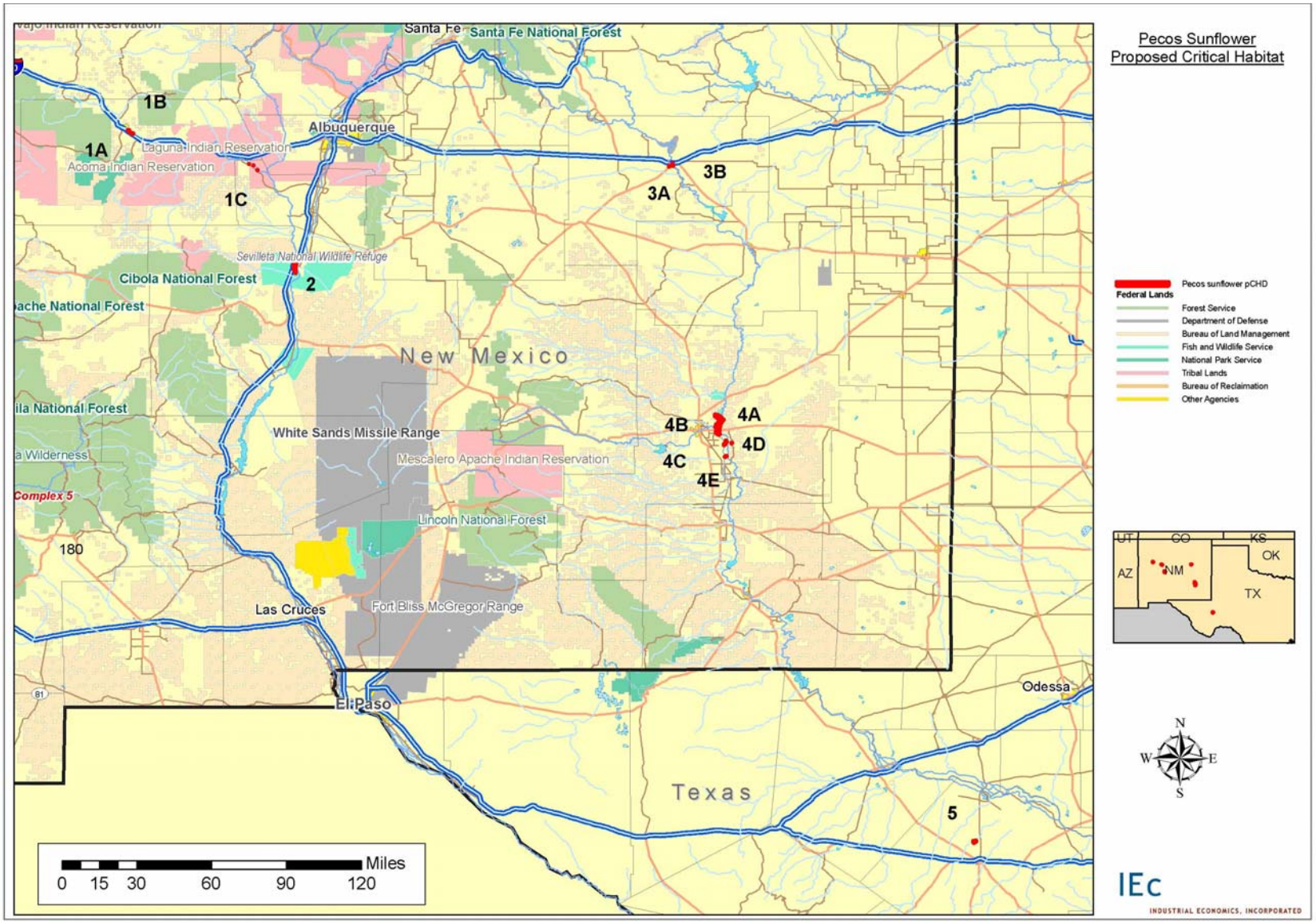

EXHIBIT 2-5 RANCHO DEL PADRE SPRING CIENEGA AND GRANTS SALT FLAT WETLAND

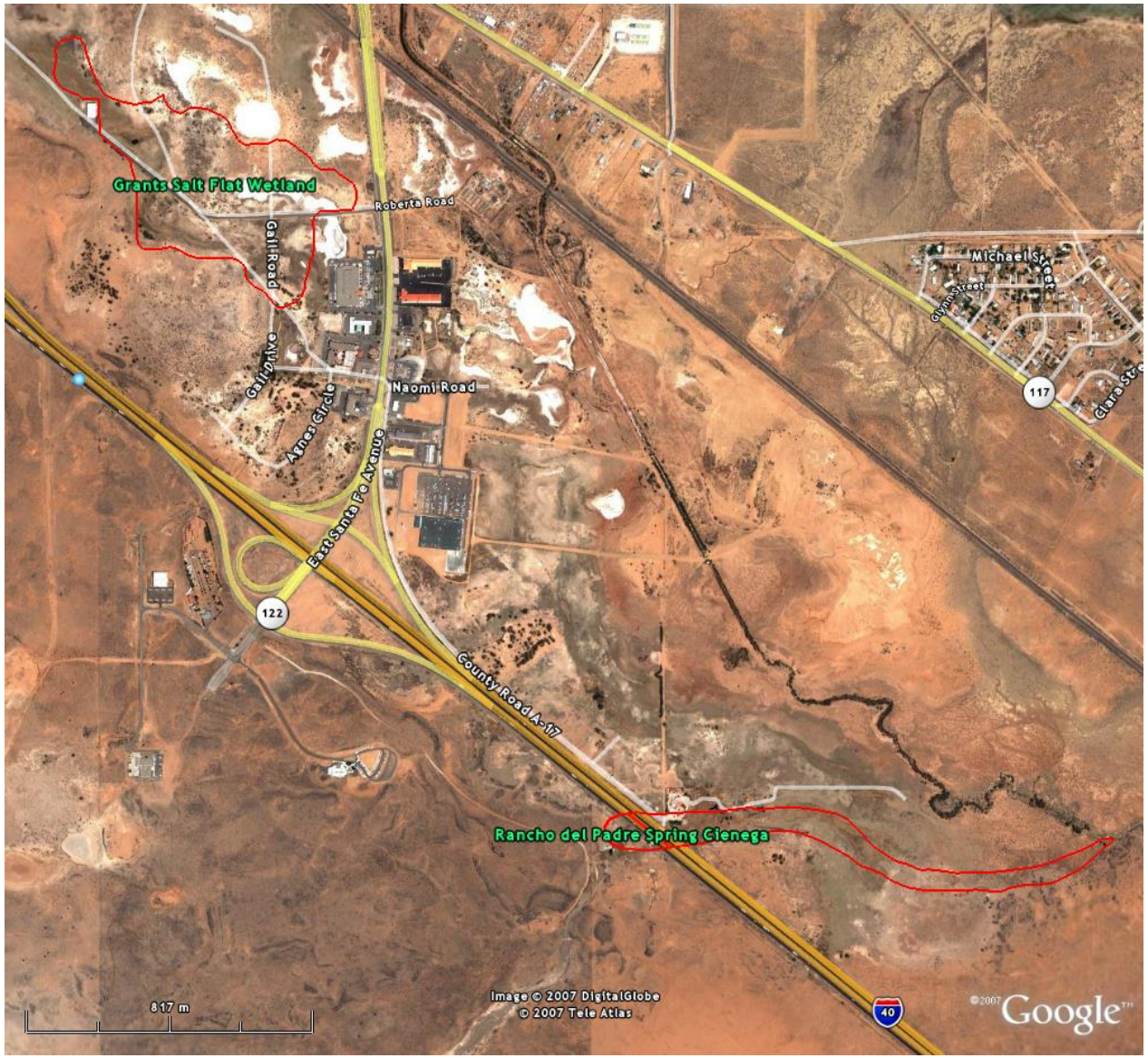

EXHIBIT 2-6 LA JOYA STATE WMA

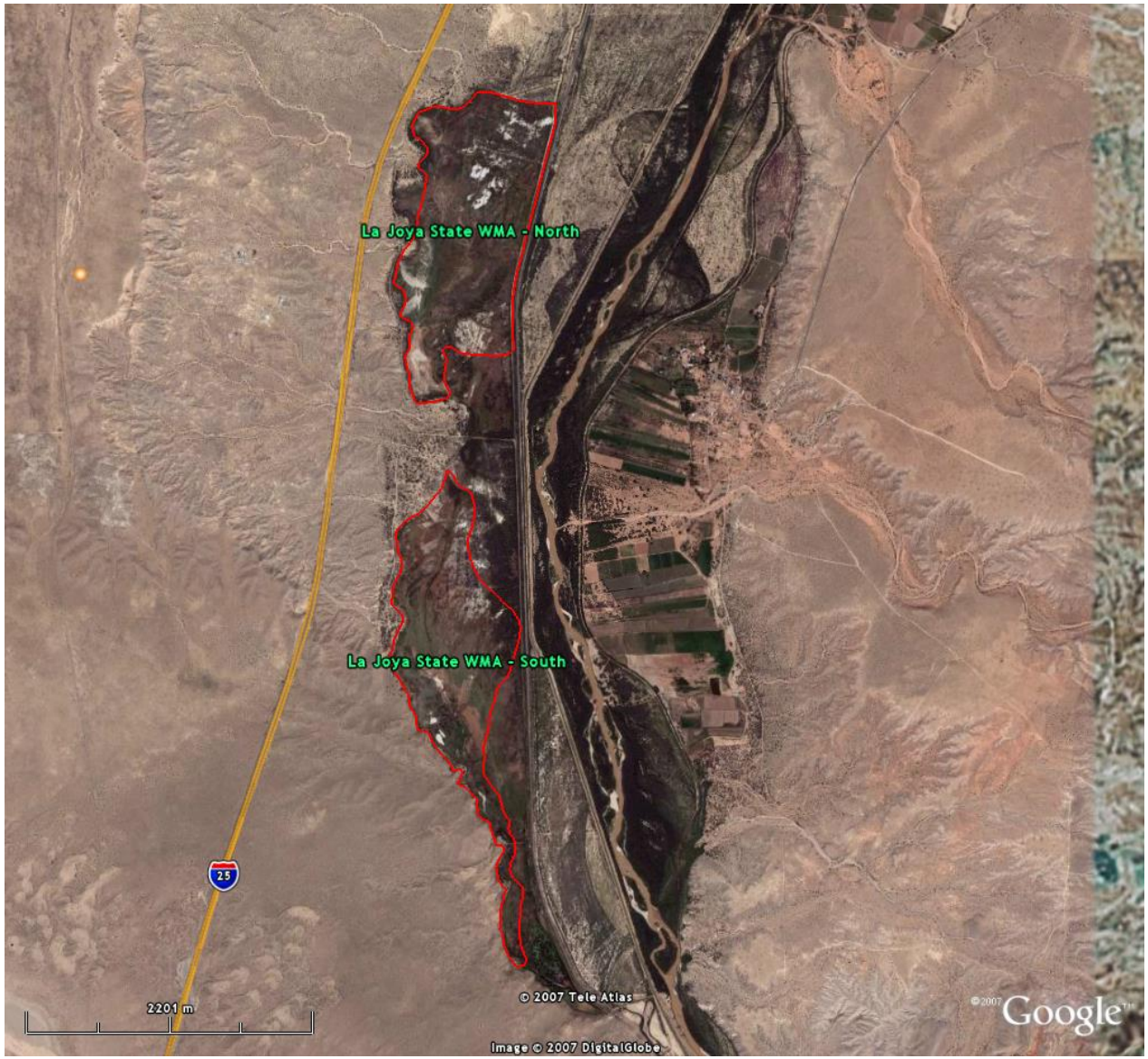

EXHIBIT 2-7 BLUE HOLE CIENEGA/BLUE HOLE FISH HATCHERY PONDS AND WESTSIDE SPRING

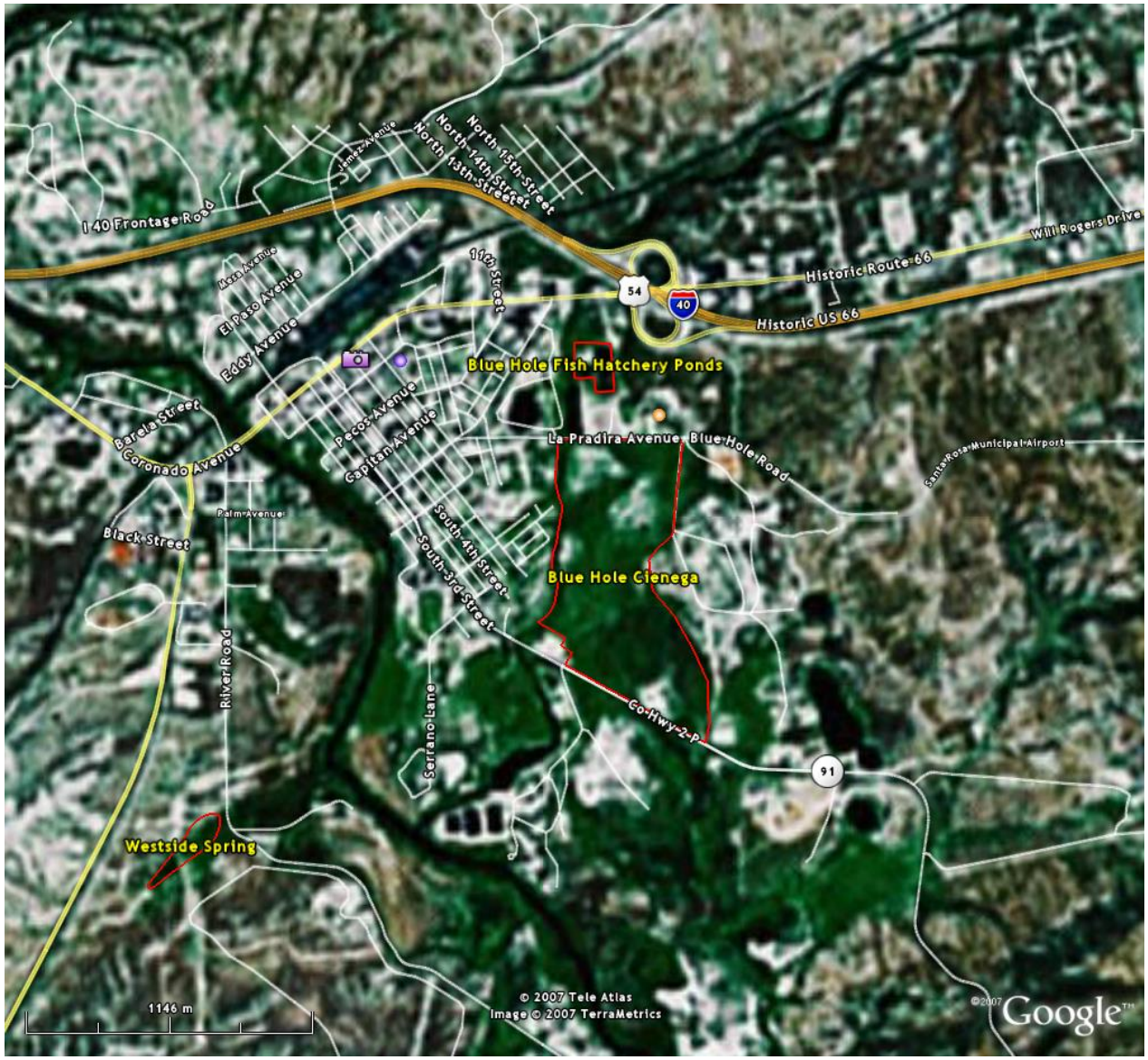

EXHIBIT 2-8 CITY OF ROSWELL LAND/BITTER LAKE NWR

EXHIBIT 2-9 BITTER LAKE NWR FARM

EXHIBIT 2-10 OASIS DAIRY AND LEA LAKE

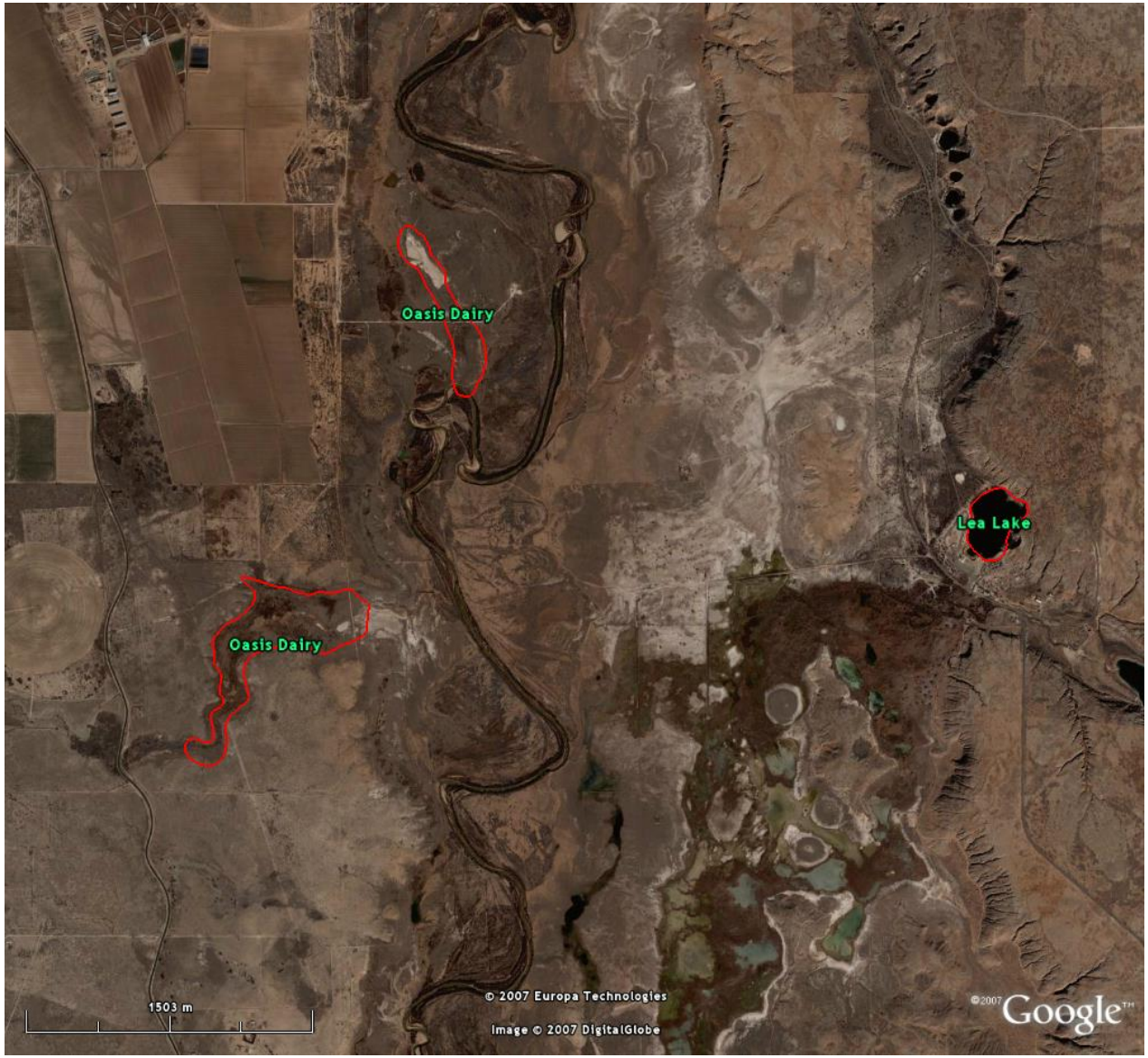

EXHIBIT 2-11 DEXTER CIENEGA

EXHIBIT 2-12 DIAMOND Y SPRING

SECTION 3 | ECONOMIC IMPACTS

42. The Service states that "the loss or alteration of wetland habitat continues to be the main threat to *H. paradoxus*…There is evidence that these habitats have been historically, and are presently being, reduced or eliminated by aquifer depletion, and severely impacted by agricultural activities and encroachment by exotic plants…The lowering of water tables through aquifer withdrawals for irrigation and municipal use, diversion of water from wetlands for agriculture and recreation uses, and wetland filling for conversion to dry land uses destroy or degrade desert wetlands."[24] This chapter focuses on identifying and quantifying impacts of conservation measures that may be undertaken to protect the sunflower within proposed critical habitat areas.

3.1 SUMMARY OF IMPACTS

43. Total past costs (1999-2006) of project modifications for projects related to the sunflower are estimated at $1.3 million (undiscounted). These costs are primarily associated with consultation efforts at Bitter Lake NWR. Other past costs are associated with the purchase of Blue Hole Cienega by the state of New Mexico.

44. Total potential future costs (2007-2026) to areas proposed for critical habitat are estimated to be $3.9 to $4.4 million over 20 years (undiscounted), as summarized by Exhibit 3-1. Because it is a wetland plant species that grows in a dry part of the country, the greatest threat to sunflower habitat is a loss of water, particularly groundwater. However, proving that water uses have a negative effect on sunflower habitat is not straightforward. Hydrological connections between water use and sunflower habitat loss are often difficult to prove. In addition, groundwater management in affected areas of Texas and New Mexico typically does not involve Federal oversight. Therefore, future impacts on water use related to sunflower conservation efforts appear improbable. The analysis therefore focuses on other threats to sunflower habitat, including encroachment of non-native species, wetland filling and development, incompatible livestock grazing, recreational activities, and proximity to major roads. Administrative costs are detailed in Appendix A.

[24] U.S. Fish and Wildlife Service, 50 CFR Part 17, Proposed Designation of Critical Habitat for the Pecos Sunflower (*Helianthus paradoxus*); Proposed Rule. March 27, 2007.

EXHIBIT 3-1 SUMMARY OF POTENTIAL FUTURE IMPACTS TO AREAS PROPOSED FOR CRITICAL HABITAT BY ACTIVITY

	TOTAL UNDISCOUNTED		DISCOUNTED AT 3%		DISCOUNTED AT 7%	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
Administrative	$648,000	$648,000	$483,000	$483,000	$345,000	$345,000
Development	$290,000	$290,000	$290,000	$290,000	$290,000	$290,000
Non-native species mgt & Roads	$2,663,000	$3,213,000	$2,282,000	$2,673,000	$1,744,000	$2,094,000
Grazing	$260,000	$260,000	$196,000	$196,000	$142,000	$142,000
Total	**$3,861,000**	**$4,411,000**	**$3,251,000**	**$3,642,000**	**$2,521,000**	**$2,871,000**

Note: Table may not sum due to rounding.

3.2 WATER WITHDRAWAL

45. The Proposed Rule lists water withdrawal as a threat to eight proposed subunits: 1a, 1c, 3b, 4a, 4b, 4c, 4e, and 5. This section discusses water withdrawal issues for these subunits. The section also discusses La Joya WMA (Unit 2) because land managers there stated that water rights issues are important at that location.

46. Because it is a wetland plant species that grows in a dry part of the country, the greatest threat to sunflower habitat is a loss of water, particularly groundwater. However, proving that water uses have a negative effect on sunflower habitat is not straightforward. Impacts to water use related to sunflower conservation efforts on water use will only occur if the following criteria are met:

- Impacts of a particular water diversion on sunflower habitat can be identified;
- A Federal nexus related to that particular water diversion exists.

47. Neither of these criteria are simple. First, direct hydrological connections between water use and sunflower habitat loss are often difficult to prove. In order for an Action agency to find that an activity is likely to adversely affect the species, they need to be confident that the activity is indeed affecting it. Because the plant often is found in wetland seeps rather than surface water, finding the source of the water to the habitat can be difficult. There is also no history of consultation on sunflower related to water use.

48. Second, groundwater management in affected areas of Texas and New Mexico typically does not involve Federal oversight. Generally, groundwater in Texas is governed by the "rule of capture," that is, groundwater is the private property of the owner of the overlying land. Overall groundwater use in the aquifer, however, is generally not limited by law. In fact, Texas water law has been summarized as follows:

> Texas water law has often been called the "law of the biggest pump." Texas courts have consistently ruled that a landowner has a right to pump all the water that he can from beneath his land regardless of the effect on wells of adjacent owners.[25]

49. In the portion of Pecos County, Texas, within the proposed designation there is no state or Federal oversight of groundwater use.[26] In areas with proposed critical habitat in New Mexico, any new water diversions, including groundwater diversions, are subject to approval by the State Engineer, who is responsible for supervision, measurement, appropriation, and distribution of the state's water.[27] However, no Federal oversight exists. A Federal nexus may exist in some cases for surface water. The following sections describe the water withdrawals in each subunit.

3.2.1 RANCHO DEL PADRE SPRING CIENEGA (1A)

50. The Rancho del Padre Spring Cienega unit is a long, narrow, 25.5-acre unit that crosses predominantly private land, but also includes land owned by the Acoma Pueblo and a right-of-way for Highway I-40. The private land is currently grazed with a few horses and cows (light grazing activity). The primary landowner has held the land in his family for several generations, and intends to develop the property at some point.[28] The Acoma Pueblo lands have recently been acquired by the Tribe,[29] which may wish to develop the land at some point, though no definitive plans were provided.

51. Field notes by a New Mexico State Forestry Division Botanist indicate that water quantity at the spring is too limiting for anything other than the present minor use or livestock watering.[30] In addition, because it is located in the Blue Water "declared groundwater basin," any new water diversions, including groundwater diversions, would be subject to approval by the State Engineer, who is responsible for supervision, measurement, appropriation, and distribution of the state's water.[31] Even if a permit were applied for by a future developer, no clear Federal nexus exists related to water

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[25] "Texas Water Law," Texas Water Resources Education, Texas A&M University, Accessed at http://texaswater.tamu.edu/waterlaw.texas.htm on June 27, 2007.

[26] As discussed below, Diamond Y Spring has a debatable water source, but appears to part of the Rustler Aquifer, for which no Groundwater Conservation District exists. Texas water development Board, http://www.twdb.state.tx.us/GwRD/GCD/plancertable1.htm accessed on September 5, 2007.

[27] A declared groundwater basin is an area of the state proclaimed by the State Engineer to be underlain by a groundwater source having reasonably ascertainable boundaries. By such proclamation the State Engineer assumes jurisdiction over the appropriation and use of groundwater from the source. Accessed at http://www.ose.state.nm.us/water_info_groundwater_basin.html on July 2, 2007.

[28] Personal communication with private landowner, June 6, 2007.

[29] Personal communications with R. Charlie, Pueblo of Acoma, on June 13, 2007.

[30] Sivinski, Robert. "New Mexico Status of *Helianthus paradoxus*, 1995 Progress Report, Section 6, Segment 10," Field Notes, 1995.

[31] A declared groundwater basin is an area of the state proclaimed by the State Engineer to be underlying by a groundwater source having reasonably ascertainable boundaries. By such proclamation the State Engineer assumes jurisdiction over the appropriation and use of groundwater from the source. Accessed at http://www.ose.state.nm.us/water_info_groundwater_basin.html on July 2, 2007.

withdrawal or appropriation. In addition to a lack of clear Federal connection, demonstrating a direct link between the use of groundwater and the drying up of Pecos sunflower habitat in this unit would be difficult, and no history of consultation on groundwater withdrawals exist related to this species. Thus, no future impacts on groundwater use in this unit are anticipated or quantified.

3.2.2 PUEBLO OF LAGUNA (1C)

52. Natural Resources staff at the Pueblo of Laguna state that the areas that contain the sunflower (these lands are undefined in the Proposed Rule) are rangelands that are located far from population centers, and are unlikely to be developed in the foreseeable future.[32] The staff at the Pueblo note that the small non-Tribal community of Highland Meadows/Correo, located north of proposed critical habitat plans future growth and water development that could affect the wetland areas on Pueblo lands.[33] The current water systems at Highland Meadows and Correo together serve approximately 200 customers.[34] As in Subunit 1a, showing a direct hydrologic link between the use of groundwater and the drying up of Pecos sunflower habitat in this unit would be difficult. Thus, no future impacts on groundwater use in this unit are anticipated or quantified.

3.2.3 BITTER LAKE NWR/CITY OF ROSWELL LAND (4A), BITTER LAKE NWR FARM (4B), OASIS DAIRY (4C), AND DEXTER CIENEGA (4E)

53. In response to a shortfall in meeting its water delivery obligations under the Pecos River Compact with Texas and an ensuing 2003 settlement agreement, the State of New Mexico has embarked on an aggressive program of buying land and water rights from willing sellers on the Pecos River and retiring irrigation of those lands.[35] The full implementation of the 2003 Pecos River Water Rights Adjudication Settlement, which includes among other things, purchase and retirement of 18,000 acres of water rights and the development of a 20,000 acre-feet per year capacity augmentation well field, is anticipated to cost about $96 million.[36] As part of this effort, groundwater wells and other diversions are being metered to measure how much water is being used and where.[37] Bitter Lake NWR is in the process of gaining approval from the State of New

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[32] Personal communication with C. Schultz, Natural Resources Manager, Laguna Pueblo, June 6, 2007.

[33] Ibid.

[34] New Mexico Drinking Water Bureau data, Accessed at http://eidea.state.nm.us/SDWIS/index.jsp on June 28, 2007.

[35] Pecos River Water Rights Adjudication Settlement Agreement, March 25, 2003, accessed at http://www.seo.state.nm.us/water-info/pecos/settlement-03-25-2003.pdf; Holmes, Sue M. "School of Natural Resources, From Earth to Sky and Everything In Between," Santa Fe New Mexican, Apr 23, 2007, accessed at http://www.freenewmexican.com/news/60642.html on July 2, 2007; Pecos River Settlement Water Rights, 2006 Appropriations Bill, http://www.legis.state.nm.us/Sessions/06%20Regular/firs/SB0577.pdf

[36] Pecos River Settlement Water Rights, 2006 Appropriations Bill, accessed at http://www.legis.state.nm.us/Sessions/06%20Regular/firs/SB0577.pdf; Ridgley, Gregory C., Deputy Chief Counsel, Office of the State Engineer, "Status of Pecos River Settlement Agreement Implementation, Presentation to the Association of Western State Engineers," Association of Western State Engineers, Denver, Colorado, May 17, 2005. accessed at http://www.water.state.co.us/pubs/presentations/AWSE/gridgley.pdf

[37] Lower Pecos River Basin Water Master, District-Specific Regulations, New Mexico Office of the State Engineer, accessed at http://www.ose.state.nm.us/PDF/ActiveWater/LowerPecos/PecosFAQs-2006-03-10.pdf

Mexico for its water rights as part of the adjudication process for the Pecos River.[38] As a result of reductions in water withdrawals, aquifer levels are rising in the Chaves County areas proposed as critical habitat (4a, 4b, 4c, 4e).[39] No future impacts on water withdrawals or use in this unit are anticipated or quantified.

3.2.4 DIAMOND Y SPRING (5)

54. The 239.7-acre area proposed as Unit 5 is owned by the Nature Conservancy (TNC), and is part of the Diamond Y Spring Preserve, which includes habitat for the endangered Leon springs pupfish (fish), the Pecos gambusia (fish), the Pecos assiminea (snail), and the sunflower. TNC reports that the 3,962-acre property was "purchased from prominent Pecos County rancher M.R. Gonzalez, primarily to protect the two endangered fish and the threatened sunflower."[40] As such, TNC is actively protecting and enhancing the ecosystem at Diamond Y Spring. Ongoing actions include efforts to control the re-invasion of salt cedar (*Tamarix ramosissima*) via manual and prescribed fire methods, building of fire breaks, biological inventory and monitoring, habitat enhancement projects, and coordination efforts with oil and gas companies to reduce and prevent the likelihood of groundwater contamination within the spring.[41] Costs associated with these conservation efforts are voluntary, and thus are not included in this analysis.

55. Despite its efforts to preserve the spring, TNC remains concerned about groundwater pumping in nearby agricultural communities, which appear to be drawing down the aquifer for the spring. TNC biologists have observed a decline in water levels in the spring during the irrigation season.[42] The hydrology of the area is quite complex, however, and debate continues about the specific aquifer source of water to Diamond Y spring.[43] Irrigation impacts on nearby shallow aquifers are well-documented.[44]

56. Because, under current Texas law, landowners in this area of Pecos County acting individually may pump as much as they can, excessive groundwater pumping of the aquifer(s) that discharge at Diamond Y preserve is likely to continue in the near future. Even with the sunflower listed, little Federal oversight exists on private lands. In

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[38] Personal communication with L. Ulibarri, Assistant Refuge Manager, Bitter Lake NWR, on June 21, 2007.

[39] Mussetter Engineering, Inc. Bottomless Lakes State Park: Aquatic Habitat Restoration Feasibility Study. Lea Lake and Associated Wetland Water Budget Report, Prepared for USACE, Albuquerque District, December 29, 2003.

40 "Diamond Y Spring Preserve", Informational fact sheet on Places We Protect, The Nature Conservancy, Accessed at http://www.nature.org/wherewework/northamerica/states/texas/preserves/art13316.html on May 3, 2007.

[41] Personal communications with J. Karges, Conservation Biologist, The Nature Conservancy, West Texas Office, on May 23, 2007 and May 29, 2007.

[42] Personal communication with J. Karges, Conservation Biologist, The Nature Conservancy, West Texas Office, on June 29, 2007.

[43] Hydrologists surmise that the Rustler aquifer may be responsible for discharges at Diamond Y Spring, an aquifer that "produces poor-quality water that is used for irrigation and livestock." Sharp, John M. "Regional Groundwater Flow Systems in Trans-Pecos Texas," Report 356, *Aquifers of West Texas,* edited by Robert E. Mace, William F. Mullican III and Edward S. Angle, December 2001.

[44] For example, see Jones, Ian C. "Cenozoic Pecos Alluvium Aquifer," Report 356, *Aquifers of West Texas,* edited by Robert E. Mace, William F. Mullican III and Edward S. Angle, December 2001.

summary, (1) no limitations exist governing the withdrawal of groundwater in Pecos County, Texas; (2) the complex geology and hydrology of the area leave uncertainty about the source of the discharge at Diamond Y, and (3) a direct link between the use of groundwater and the drying up of Pecos sunflower habitat on Diamond Y Spring has not been proven; and (4) no clear Federal nexus exists. As a result of these complicating factors, conservation measures involving changes to water use to protect the sunflower that involve a Federal nexus activity are not probable, and none are quantified in this analysis.

3.2.5 LA JOYA WMA (2)

57. La Joya Wildlife Management Area is a state-owned area that is managed for waterfowl, and allows hunting and fishing during much of the year.[45] The 3,550-acre WMA encompasses an 854-acre proposed critical habitat unit. The WMA contains a series of ponds in which water levels are manipulated throughout the year to approximate natural water conditions and to maximize wetland habitat. The sunflower population was discovered at this site relatively recently, and is believed to be thriving under the current water management regime.[46] Hence, water issues are not listed as a threat to the species in the Proposed Rule. Nonetheless, managers point out that the State of New Mexico does not currently own rights to the water at La Joya.[47] Instead, it has a written agreement with the Middle Rio Grande Conservancy District to receive agricultural return flows during the winter months (approximately October through March).[48]

58. While the State does not hold secured water rights for this area, it takes water at a time of year when other water demands are at their lowest. Thus, to date, there have been few conflicts associated with competing demand for this water.[49] However, both the managers at La Joya and the Middle Rio Grande Conservancy District (MRGCD) have expressed that, in the future, water conflicts could emerge. In its public comments, MRGCD states that any attempts to maintain water levels at its adjacent Drain No. 7 facility "could have a profound economic impact on the agricultural sector of the middle Rio Grande valley. If conditions become dry, they could impact the State's ability to meet its obligations under the Rio Grande Compact.[50]" There was one recorded instance

[45] New Mexico Department of Game and Fish, "La Joya Waterfowl Area", accessed at http://www.wildlife.state.nm.us/conservation/wildlife_management_areas/documents/LaJoyaWA.pdf on July 2, 2007.

[46] Personal communication with J. Hirsch, Department Lands Specialist, New Mexico Department of Game and Fish, on June 20, 2007.

[47] Personal communication with J. Hirsch, Department Lands Specialist, New Mexico Department of Game and Fish, on June 20, 2007; Personal communication with M. Guston, New Mexico Department of Game and Fish on June 4, 2007; Personal communication with M. Watson, New Mexico Department of Game and Fish on June 4, 2007.

[48] Public comments of Bruce Thompson, New Mexico Department of Game and Fish, January 9, 2008; Personal communication with M. Guston, New Mexico Department of Game and Fish on June 4, 2007; Personal communication with M. Watson, New Mexico Department of Game and Fish on June 4, 2007.

[49] Personal communication with J. Hirsch, Department Lands Specialist, New Mexico Department of Game and Fish, on June 20, 2007; Personal communication with M. Guston, New Mexico Department of Game and Fish on June 4, 2007.

[50] Public comments on the proposed critical habitat designation for the Pecos sunflower by Subhas Shah, Chief Engineer and CEO, Middle Rio Grande Conservancy District, Albuquerque, New Mexico, June 1, 2007.

where delivery to La Joya's holding ponds was postponed "since MRGCD was delivering water to the floodway at San Acacia to meet flow requirements for the Rio Grande silvery minnow."[51] However, the specific future water needs of the plant are not certain, and any potential changes to water management that could be needed to protect the plant have not been identified. Thus, no future impacts on water withdrawals in this unit are quantified.

3.3 WETLAND FILLING AND DEVELOPMENT

59. The Proposed Rule lists "wetland filling and development" as a threat in seven of proposed critical habitat subunits: 1a, 1b, 3a, 3b, 4a, 4c, 4e, and 5. Since the plant was listed in 1999, no section 7 consultation has taken place regarding development, though development has occurred in the vicinity of the plants since listing (e.g., see Rancho del Padre Spring Cienega description below). Because the plant lives in wetland areas, it is possible that any future development activity will require section 404 wetlands permits from USACE, depending on whether the USACE asserts jurisdiction over the particular areas proposed to be developed.[52] The likelihood of development occurring is unknown for several proposed critical habitat units. Thus, impacts to wetland filling and development activities related to sunflower conservation efforts will only occur if the following occur:

- A wetland filling and development activity is planned within proposed critical habitat areas;
- A Federal nexus related to that particular parcel exists (such as a USACE permit), and the Action agency initiates consultation with the Service.

60. The Recovery Plan for the sunflower states: "Private lands with core conservation habitat are secure when the habitat is either owned by a non-profit conservation organization or a branch of government that is capable and qualified to monitor and manage the easement. Isolated stands should also be protected through easements or acquisition; however, in some cases landowner incentive programs such as Safe Harbor agreements that includes Pecos sunflower may be appropriate..." Thus, it appears probable that the Service would recommend avoiding development in proposed areas should development be planned in an area not owned by a non-profit organization or protected by an easement. However, this would only occur if the development requires a Federal permit and consultation with the Service is undertaken. The Service points out that, even in that case, any recommendations by the Service would be discretionary on the part of the landowner.[53]

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[51] Public comments of Bruce Thompson, New Mexico Department of Game and Fish, January 9, 2008; Personal communication with M. Guston, New Mexico Department of Game and Fish on June 4, 2007

[52] USACE states that unless an affected wetland is considered to be isolated, USACE will likely assert jurisdiction over it. Personal communication with J. Wood, USACE Regulatory Branch, New Mexico, May 21, 2007.

[53] Written communication with Service, Southwestern Regional Office and Albuquerque Ecological Services offices, August 1, 2007 and personal communication with Service, Southwestern Regional Office and Albuquerque Ecological Services offices, September 4, 2007.

Thus, development impacts discussed in this analysis are likely to overstate likely impacts.

61. If owners of parcels containing designated critical habitat face land use restrictions that preclude development on some or all of the parcel, the value of the properties will be reduced, essentially eliminating the option that those portions of the parcels be developed. If there were some residential project being considered for a set number "X" years in the future and habitat designation would limit that development, the appropriate opportunity cost for that project would be its anticipated future value of the development rights, discounted by the "X" years. When no prediction is possible, the best measure of anticipated opportunity costs is to look at present land values.[54]

62. If real estate markets are competitive, the value of undeveloped residential land should capture the market's current best predictions of the future value of residential developments given the uncertain probabilities of the development occurring, and the uncertainty concerning its timing.[55] For example, if there is some chance that a residential sub-division will be located on a parcel in the future, the price of that parcel will rise today in anticipation of the future construction relative to the prices of other parcels. Furthermore, if there are two parcels that have some likelihood of being developed in the future, then the parcel that is likely to be developed sooner will have a higher price in the present. In this way the price of current undeveloped real estate will capture, in expectation, the predicted, discounted stream of benefits that will accrue to development on that real estate. This attribute of land markets allows estimation of future opportunity costs based on current prices. Thus, where development is the most likely future land use, the current market value of these lands is assumed to reflect the full option value for future development.

3.3.1 RANCHO DEL PADRE SPRING CIENEGA (1A)

63. The private land proposed for critical habitat is currently lightly grazed, and includes a small cleared area that is associated with a residential home. As discussed above, the primary landowner has held the land in his family for several generations, and intends to develop the property at some point, possibly as an industrial park.[56] The 2.9 acres of Acoma Pueblo lands have recently been acquired by the Tribe,[57] which may wish to develop the land at some point, though no definitive plans were provided.

64. Some areas known to formerly contain sunflower along Route 122 have been developed by filling wetlands. USACE states that, although no USACE permit was required for that

[54] O'Sullivan, Arthur *Urban Economics*, 5th ed., (New York, New York: McGraw-Hill/Irwin: 2003).

[55] Freeman, A. Myrick III (2003) *The Measurement of Environmental and Resource Values,* 2nd ed.: Washington: Resources for the Future

[56] Personal communication with private landowner, June 6, 2007; Personal communication with Albuquerque Ecological Services Office, Service, July 11, 2007.

[57] Personal communications with R. Charlie, Pueblo of Acoma, on June 13, 2007.

development activity, future development in critical habitat areas are likely to require a permit because they are in wetland areas. [58]

65. The current price of raw land in the vicinity of Interstate 40 is approximately $3,300 per acre.[59] The value of the land that could be made unavailable for development in this 25.5-acre unit is $84,000. Note that this value captures both the value that these acres would retain for agricultural purposes as well as potential development value. Thus, the value of development potentially lost is somewhat less than this value.

3.3.2 GRANTS SALT FLAT WETLAND (1B)

66. An owner of this property stated that this property was recently purchased by the Acoma Pueblo. However, the Acoma Pueblo state that they did not purchase this property.[60] Regardless of ownership, the future use of this land is uncertain. However, due to its proximity to other development, this analysis assumes that the land will be slated for development at some point in the next 20 years, and that a permit from USACE will be required. Assuming that the proposed lands will need to be avoided for development purposes, the value of the land that would be made unavailable for development in this 62.5-acre unit is approximately $206,000.[61] As above, this value captures both the value that these acres would retain for agricultural purposes as well as potential development value. Thus, the value of development potentially lost is somewhat less than this value.

3.3.3 BLUE HOLE CIENEGA/BLUE HOLE FISH HATCHERY (3A)

67. Approximately six acres of this unit are owned by the City of Santa Rosa as part of the Blue Hole Fish Hatchery ponds. The City plans to renovate these currently unused ponds by dredging and re-filling them, though no solid plans exist to do so.[62] Because no immediately foreseeable plans exist, no conservation efforts are anticipated for the sunflower, and none are quantified in this analysis.

68. The remaining approximately 128 acres in this unit were purchased by the State of New Mexico expressly for the purpose of protecting the sunflower, and are not threatened by development activity.[63]

3.3.4 WESTSIDE SPRING (3B), OASIS DAIRY (4C), DEXTER CIENEGA (4E)

69. The proposed critical habitat areas in these units are privately owned and believed to be developable. However, no plans to develop these areas have been expressed, and none are

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[58] Personal communication with J. Wood, USACE Regulatory Branch, New Mexico, May 21, 2007.

[59] This is the weighted average estimate of parcels specifically included in proposed CHD in this area of Cibola County. Data provided by Cibola County Assessor's Office, June 13, 2007.

[60] Personal communication with former private landowner on June 6, 2007.

[61] As above, this assumes a property value of $3,300 per acre. Data provided by Cibola County Assessor's Office, June 13, 2007.

[62] Personal communication with T. Dodge, Community Development Officer, City of Santa Rosa, June 4, 2007.

[63] Personal communication with R. Sivinski, Forestry Division, Energy, Minerals, and Natural Resources Department, State of New Mexico. May 24, 2007.

zoned for residential or commercial use. Further, these units occur in rural areas in Chaves and Guadalupe Counties where little development pressure exists. Therefore, development of these units in the foreseeable future appears improbable.

3.3.5 CITY OF ROSWELL LAND (4A)

70. The proposed critical habitat in this unit is owned by the City of Roswell, and is currently not actively used.[64] Field notes by a New Mexico State Forestry Division Botanist on this species state that the water table in this unit is too high to warrant filling of the area for development purposes.[65]

3.3.6 DIAMOND Y SPRING (5)

71. As stated above, the land area proposed as critical habitat at Diamond Y Spring is owned by TNC, and does not face residential development pressure. However, the subsurface mineral rights are not owned by TNC. Thus, a future threat of filling and development for drilling pads and access roads for oil and gas interests exists. The current mineral rights owner does not have plans to develop in Diamond Y. Nonetheless, oil and gas development could occur, should the rights be traded.[66] Because there is no Federal nexus believed to be involved, no mitigation costs are anticipated.

72. Potential impacts to wetland filling and development activities are summarized in Exhibit 3-2.

EXHIBIT 3-2 POTENTIAL WETLAND FILLING AND DEVELOPMENT IMPACTS

UNIT/SUBUNIT	ESTIMATED FOREGONE DEVELOPMENT (ACRES)	AVERAGE VALUE PER ACRE ($2007)	TOTAL VALUE OF FOREGONE DEVELOPMENT ($2007)
1a: Rancho del Padre Spring Cienega	22.6 (private non-Tribal) 2.9 (Tribal)	$3,300	$84,000
1b: Grants Salt Flat wetland	62.5 (private)	$3,300	$206,000
TOTAL			$290,000

Notes: No foregone development is anticipated in Subunits 3a, 4a, or 5. Totals may not sum due to rounding. Data from Cibola County Assessor's office, June 13, 2007; Land values in Cibola County, Accessed on May 18, 2007 at http://www.cibolarealestate.com/cgi-bin/findhome4

[64] Personal communication with G. Pinkerton, Chaves County Planning and Zoning Department on May 23, 2007.

[65] Sivinski, Robert. "Pecos Sunflower Conservation Agreements, 1997-1998 Progress Report, Section 6, Segment 10," Field Notes, September 30, 1998; Sivinski, Robert. "New Mexico Status of *Helianthus paradoxus*, 1995 Progress Report, Section 6, Segment 10," Field Notes, 1995.

[66] Personal communications with J. Karges, Conservation Biologist, The Nature Conservancy, West Texas Office, on May 23, 2007 and May 29, 2007.

3.4 INCOMPATIBLE LIVESTOCK MANAGEMENT

73. The Proposed Rule states that "well-managed grazing during flowering months may have a beneficial effect on *H. paradoxus* populations by decreasing the density and biomass of potentially competing plant species in these habitats." However, "livestock will eat *H. paradoxus* when other forage is scarce, and when the buds are developing and abundant." Therefore, incompatible livestock management, rather than all livestock grazing, is listed as a threat to the sunflower in the Proposed Rule.

74. As discussed in Section 1.2.1 of the analysis, the Act does not specifically prohibit "take" of endangered plants unless the plants are under Federal jurisdiction or the action is otherwise in violation of state law. As a result, the economic analysis for the sunflower does not estimate the cost of potential conservation efforts voluntarily undertaken by private landowners on private lands. Because of the unique relationship between Tribal governments and the U.S. government, and because it is possible that the Tribes may feel compelled, due to their preference to manage their own lands under their own Tribal process rather than through section 7 consultations, to undertake conservation measures for the plant, potential impacts on private Tribal lands are discussed and included in this analysis. Incompatible livestock management is listed as a threat to two subunits that contain Tribal lands: Rancho del Padre Spring Cienega (1a) and Pueblo of Laguna (1c).

3.4.1 RANCHO DEL PADRE SPRING CIENEGA (1A)

75. The 2.9 acres of Pueblo of Acoma lands included in this unit may be grazed in the future. While it is unknown whether the Tribe will make specific management efforts for the sunflower, they may draft a management plan for the species similar to that of the Laguna Tribe.[67]

3.4.2 LAGUNA PUEBLO (1C)

76. The Pueblo of Laguna lands are lightly grazed. However, the Laguna are conscious of the importance of the sunflower, and the area, which is located away from population centers, is generally avoided by people.[68] The Laguna submitted a draft management plan for the sunflower to the Service in February 2007, as described in the Proposed Rule, and has been working with the Service to finalize this document. The Natural Resources Department for the Pueblo reports that future actions to conserve the sunflower will include monitoring the area, and may include temporary fencing to protect the plant from livestock during its reproductive period.[69] Based on similar costs of these actions by non-Tribal entities, costs of these actions are estimated to be $205,000 (undiscounted), or $111,000 discounted at seven percent.

77. Potential impacts to grazing activities are summarized in Exhibit 3-3.

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[67] Public comments of Chandler Chavez, Governor, Pueblo of Acoma, January 9, 2008, primarily speak to the Tribe's purchase of the Gottlieb Ranch, which appears to be outside of the proposed critical habitat area. Written communication with R. Charlie, Pueblo of Acoma, on June 18, 2007. Because of the small size of the parcel included in proposed CHD (2.9 acres), costs of temporary fencing and monitoring are assumed to be one quarter of those incurred by the Laguna Tribe.

[68] Personal communication with C. Schultz, Manager, Natural Resources Department, Laguna Pueblo, June 6, 2007.

[69] Personal communication with C. Schultz, Manager, Natural Resources Department, Laguna Pueblo, June 6, 2007.

EXHIBIT 3-3 FUTURE IMPACTS OF SUNFLOWER CONSERVATION EFFORTS ON LIVESTOCK GRAZING ACTIVITIES IN AREAS PROPOSED FOR CRITICAL HABITAT (UNDISCOUNTED)

UNIT/SUBUNIT	OWNERSHIP	CONSERVATION EFFORTS	COSTS
Areas Proposed for Critical Habitat			
1a: Rancho del Padre Cienega	Private/Tribal	None on private lands. Management plan, monitoring, and temporary fencing on Tribal lands.	$55,000
1c: Pueblo of Laguna	Tribal	Management plan, monitoring, temporary fencing	$205,000

3.5 ENCROACHMENT BY NON-NATIVE VEGETATION

78. This section discusses efforts to eliminate non-native vegetation in the following subunits: 1b, 1c, 2, 3a, 3b, 4a, 4b, and 4d.

3.5.1 GRANTS SALT FLATS (1B) AND WESTSIDE SPRING (3B) (PRIVATE)

79. The Grants Salt Flats (1b) and Westside Spring (3b) subunits are wholly privately owned. As discussed in Section 1.2.1 of the analysis, the Act does not specifically prohibit "take" of endangered plants unless the plants are under Federal jurisdiction or the action is otherwise in violation of state law. Because private entities are not expected to attempt to mitigate the invasion of non-native plants unless compelled to by a state or Federal permitting requirement, costs associated with encroachment of non-native vegetation are not anticipated to be undertaken by owners of private lands in proposed critical habitat.

3.5.2 LAGUNA PUEBLO (1C)

80. As described above, the Pueblo of Laguna submitted a draft management plan for the sunflower to the Service in February 2007, and has been working with the Service to finalize this document. Future actions to conserve the sunflower will include monitoring the area, and may include temporary fencing to protect the plant from livestock during its reproductive period.[70] These costs are estimated under the "Incompatible Livestock Grazing" subhead.

3.5.3 LA JOYA WMA (2)

81. The Recovery Plan for the sunflower states that La Joya "is managed by the State Department of Game and Fish as a migratory waterfowl habitat, which is compatible with preservation of wetlands for Pecos Sunflower." While the area is managed by the State of New Mexico, it was purchased using Federal funds.[71] In addition, approximately 75 percent of the annual budget for the area is reimbursed to the State through Federal

[70] Personal communication with C. Schultz, Manager, Natural Resources Department, Laguna Pueblo, June 6, 2007.

[71] Service, "Pecos Sunflower (*Helianthus paradoxus*) Recovery Plan," September 2005, p.12.

Pittman-Roberts funds.[72] Therefore, actions that may affect the Pecos sunflower at La Joya are subject to consultation with the Service.[73]

82. Game and Fish Department wildlife managers state that, while many of the ongoing activities at La Joya benefit the sunflower, including non-native species removal activities, management of the area for the Pecos sunflower will increase the cost of non-native species removal from approximately $200 per acre for aerial spraying to $1,000 to $1,500 for manual/mechanical "chop and pull" treatments.[74] The State plans to treat approximately 1,500 acres for non-natives in the next few years at La Joya. This analysis assumes that all 857 acres at La Joya that are proposed for critical habitat will need to be treated manually instead of by aerial spraying. As a result, an increased cost of $800 to $1,200 per acre, or $0.6 million to $1.1 million across the area for non-native species removal efforts are expected over the next 20 years (undiscounted), or $0.6 to $0.9 million, discounted at seven percent.

3.5.4 BLUE HOLE CIENEGA/BLUE HOLE FISH HATCHERY PONDS (3A)

83. As described above, approximately six acres of this unit are owned by the City of Santa Rosa as part of the Blue Hole Fish Hatchery ponds. The City voluntarily stopped mowing this area several years ago in order to protect the sunflower. In addition, the City has spent under $1,000 on signage to provide information on the plant locations to the public.[75]

84. In 2005, the State of New Mexico purchased the area known as Blue Hole Cienega in order to protect Pecos sunflower habitat.[76] The purchase was completed through a $75,000 grant from the Service and $75,000 from the New Mexico Department of Transportation.[77] An additional $50,000 was spent to replace approximately three miles of existing boundary fence that was no longer adequate to stop livestock egress onto the property.[78] These costs are included as past costs of sunflower conservation. Currently, the State has a grant of $100,000 to conduct non-native species eradication efforts over the next couple of years. Assuming that similar grants are received every four years

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[72] Personal communication with J. Hirsch, Department Lands Specialist, New Mexico Department of Game and Fish, on June 20, 2007.

[73] As stated in the Recovery Plan for the Pecos Sunflower: "The purchase of [La Joya] involved Federal funds. Therefore, the State is required to consult with the Service prior to taking actions that may effect the Pecos sunflower." Service, "Pecos Sunflower (*Helianthus paradoxus*) Recovery Plan," September 2005, p.12.

[74] Personal communication with J. Hirsch, Department Lands Specialist, New Mexico Department of Game and Fish, on June 20, 2007.

[75] Personal communication with T. Dodge, Community Development Officer, City of Santa Rosa, June 4, 2007.

[76] "Oasis purchase could save endangered sunflower," Casper Star-Tribune, July 20, 2005 and May 16, 2007; Personal communication with R. Sivinski, Forestry Division, Energy, Minerals, and Natural Resources Department, State of New Mexico. May 24, 2007.

[77] Personal communication with S. Reed, New Mexico State Highway and Transportation Department on May 23, 2007; "Oasis purchase could save endangered sunflower," Casper Star-Tribune, July 20, 2005 and May 16, 2007.

[78] Intra Service Section 7 Biological Evaluation of purchase of Blue Hole Cienega property, 05-530, August 26, 2005; Personal communication with S. Reed, New Mexico State Highway and Transportation Department on May 23, 2007.

throughout the next 20 years, future costs of non-native species removal efforts by the State Forestry Division are anticipated to be approximately $500,000 (undiscounted), or $265,000 discounted at seven percent.

3.5.5 LEA LAKE AT BOTTOMLESS LAKES STATE PARK (4D)

85. The proposed critical habitat area at Lea Lake is a lake that is actively used as a recreational area for swimming, picnicking, and fishing. Park managers voluntarily stopped mowing the perimeter of the pond several years ago, which they comment has led an increase in non-native sedge in the area where the sunflower grows.[79] A large habitat restoration project in cooperation with USACE is planned for the Lake area, as described below under the "Recreational Facilities" subhead. The State of New Mexico does not appear to be compelled to conduct additional actions on behalf of the sunflower, unless additional projects using Federal funds are undertaken. No additional such projects are anticipated at this time by park managers or the USACE.[80] Therefore, no additional costs associated with managing the sunflower are estimated.

3.5.6 BITTER LAKE NWR AND NWR FARM (4A AND 4B)

86. Approximately 4,166 acres within the Bitter Lake NWR and Bitter Lake NWR Farm are proposed as critical habitat for the sunflower, constituting 76 percent of the area proposed as critical habitat for the sunflower. As stated in the Bitter Lake NWR Comprehensive Conservation Plan (CCP), "while originally established to save wetlands vital to the perpetuation of migratory birds, the isolated gypsum springs, seeps, and associated wetlands protected by the refuge have been recognized as providing the last known habitats in the world for several unique species.[81]" As such, the first goal in the CCP is "to restore, enhance, and protect the natural diversity on the Bitter Lake NWR including threatened and endangered species by (1) appropriate management of habitat and wildlife resources on refuge lands; and (2) by strengthening existing, and establishing new cooperative efforts with public and private stakeholders and partners."[82] Thus, the refuge has undertaken numerous efforts to conserve and protect the sunflower since its listing.

87. Since the sunflower was listed in 1999, the Service has conducted approximately 11 informal consultations and two formal consultations related to the treatment of non-native/noxious plants and/or insects on Bitter Lake NWR and Bitter Lake NWR Farm. An additional formal consultation was conducted regarding a ditch rehabilitation project. Most consultations were concluded at the informal consultation stage because the Refuge

[79] Personal communication with S. Patterson, Bottomless Lakes State Park Manager, on June 14, 2007.

[80] Personal communication with S. Patterson, Bottomless Lakes State Park Manager, on June 14, 2007; Personal communication with O. Hummel, Environmental Resources Section, USACE New Mexico, on May 21, 2007.

[81] "Final Bitter Lake National Wildlife Refuge Comprehensive Conservation Plan," prepared by Research Management Consultants for the Service, Region 2, September 25, 1998.

[82] Ibid.

implements the following Best Management Practices regarding pesticide/insecticide application:[83]

- Spraying of pesticides is not performed during periods of gusty wind, when inversions exist, when wind velocities exceed seven miles per hour, or when wind directions favor possible drift toward rivers or wetland areas;
- Application of pesticide will occur as low over plants as feasible to avoid drift; Ground application broadcast equipment with low pressure/large droplet nozzles will be employed to administer a swath over the top of irrigation pipelines. Spot/handheld equipment will be utilized to treat around refuge facilities and structures. An agriculturally approved drift-reducing agent should be considered for broadcast treatments;
- A minimum of 50 foot buffer will be established between areas to be treated and any surface waters;
- Treatment will be made as soon as feasible after the dissipation of farm irrigation waters to avoid any possibility of runoff into adjacent bodies of water. No treatment will be made if significant rainfall is predicted within 24 hours of planned application;
- Application should be avoided when air temperatures exceed 85 degrees Fahrenheit;
- All additional label or country bulletin precautions or recommendations must be strictly followed.

88. Refuge Managers report that, while overall, most management for the sunflower is not active, i.e. it involves preservation and protection of the habitat for the species, the following conservation activities are conducted annually at the Refuge which benefit the sunflower:[84]

- Water level manipulations: these activities take into consideration the germination time of the sunflower, but are not cost intensive;
- Dike maintenance: these activities benefit the sunflower by allowing for continued water level manipulations;
- Non-native species removal efforts;
- Prescribed fires in wetland areas: 30 to 50 percent of wetland burns are typically done to benefit the sunflower;

[83] For example, see Intraservice Section 7 Biological Evaluation, Application of insecticide Roundup/GlyphoMate 41, Ground, around irrigation pipelines, facilities, and structures, April 10, 2003, 03-309; Attachment 3, U.S. Department of Interior Pesticide Use Proposal, R2-03-22510-07, dated April 3, 2003.

[84] Personal communications with L. Ulibarri, Assistant Refuge Manager, Bitter Lake NWR, on June 22, 2007 and September 11, 2007.

- Biological monitoring and observation: these activities are conducted by an on-site biologist, who spends approximately nine percent of his time on sunflower-related activities;
- Avoidance of areas for mowing, not allowing trampling by recreators;
- Road maintenance efforts: often remove non-natives and allow for establishment of sunflower.

89. Refuge managers estimate that approximately ten percent of the Refuge's annual budget is typically spent on sunflower-related conservation efforts.[85] As the annual operating budget for the Refuge has been approximately $660,000 in recent years, sunflower efforts represent approximately $66,000.[86] Prescribed fire efforts are conducted using a separate budget process, but are assumed to result in an approximate annual additional expenditure of $10,000 for the sunflower at Bitter Lake NWR. Lacking information to indicate otherwise, this analysis assumes that funding levels and level of effort for sunflowers at the Refuge and Refuge Farm will remain constant over the 20 years of this analysis. Therefore, an estimated $1.3 million will be spent related to Pecos sunflower management at the Refuge and $0.25 million will be spent at the Refuge Farm over the next 20 years (undiscounted), or $0.7 million at the Refuge and $0.13 million at the NWR Farm, discounted at three percent. Future administrative consultation costs are presented in Appendix A. Past costs at the Refuge and Refuge Farm are estimated to be $608,000 since 1999.

90. Potential impacts to non-native species management activities are summarized in Exhibit 3-4.

[85] Personal communications with L. Ulibarri, Assistant Refuge Manager, Bitter Lake NWR, on June 22, 2007 and September 11, 2007.

[86] Service budget data for 2006 and 2007. Personal communication with L. Ulibarri, Assistant Refuge Manager, Bitter Lake National Wildlife Refuge, on June 22, 2007.

EXHIBIT 3-4 FUTURE IMPACTS ON NON-NATIVE SPECIES MANAGEMENT ACTIVITIES

UNIT/SUBUNIT	OWNERSHIP	CONSERVATION EFFORTS	COSTS (UNDISCOUNTED)
1b: Grants Salt Flat wetland	Private	None.	$0
1c: Pueblo of Laguna	Tribal	See livestock grazing section.	
2: La Joya WMA	State	Mechanical treatment of non-native plants in place of aerial spraying.	$0.6 million to $1.1 million
3a: Blue Hole Cienega/Blue Hole Fish Hatchery	State/Municipal	Non-native species eradication efforts.	$500,000
3b: Westside Spring	Private	None.	$0
4a: Bitter Lake NWR	Federal	Best Management Practices, water manipulations, dike maintenance, non-native species removals, prescribed fire, biological monitoring, avoidance of areas for mowing, road maintenance.	$1.3 million
4b: Bitter Lake NWR Farm	Federal		$0.25 million
4d: Lea Lake	State	See Recreational Facilities section.	
Total costs			**$2.4 to $3.0 million**

Note: Costs associated with Bitter Lake NWR and Bitter Lake NWR are appropriated according to the relative size in acres of areas proposed for exclusion.

3.6 RECREATIONAL AND PARK MAINTENANCE ACTIVITIES

91. The Proposed Rule states that two subunits are threatened by recreational and park maintenance activities. These units are Blue Hole Cienega/Blue Hole Fish Hatchery Ponds (3a) and Lea Lake at Bottomless Lakes State Park (4d).

3.6.1 BLUE HOLE CIENEGA/BLUE HOLE FISH HATCHERY PONDS(3A)

92. Approximately 6.3 acres of subunit 3a is owned by the City of Santa Rosa, and is managed as part of a group of former fish hatchery ponds that are currently used for fishing and picnicking. The biggest attraction of the area, Pond Lake, is not proposed as critical habitat. The specific area proposed as critical habitat for the sunflower is currently not used, and contains ponds that have filled with silt and become overgrown. However, the City of Santa Rosa has plans to redevelop the ponds for municipal use at some point in the future, though concrete plans do not yet exist.[87]

93. As discussed above, the State of New Mexico purchased the area known as Blue Hole Cienega in order to protect Pecos sunflower habitat in 2005.[88] This Proposed Rule does not list recreation as a threat to the state-managed lands in this unit.

[87] Personal communication with D. Dodge, Community Development Officer, City of Santa Rosa, June 4, 2007.

[88] "Oasis purchase could save endangered sunflower," Casper Star-Tribune, July 20, 2005 and May 16, 2007; Personal communication with R. Sivinski, Forestry Division, Energy, Minerals, and Natural Resources Department, State of New Mexico. May 24, 2007.

3.6.2 LEA LAKE AT BOTTOMLESS LAKES STATE PARK (4D)

94. As stated above, the proposed critical habitat area at Lea Lake is actively used as a recreational area for swimming, picnicking, and fishing. Currently, a large project is planned in cooperation with the USACE to widen the outlet channel from the Lake and to restore a downstream area for riparian habitat, which is anticipated to become habitat for the sunflower. The project, which has not yet been funded, is primarily being undertaken to alleviate flooding of the recreational facilities that has been occurring in recent years.[89] The project area for this project is largely outside of proposed critical habitat. In fact, the only overlapping area is the small outlet point for the channel at the south side of the lake.[90] The Service and USACE conducted an informal consultation that addressed potential impacts of the project on the sunflower at the lake. The Service concurred with the finding of "not likely to adversely affect" the sunflower because the USACE plans to implement a number of conservation efforts for the project, including avoiding all existing Pecos sunflower plants during project implementation.[91] USACE states that any costs associated with avoiding existing plants and otherwise accommodating the Pecos sunflower plants in the proposed critical habitat are likely to be minor.[92] Because the Lake is state-operated, no Federal actions are generally involved in the operations at the facility.[93] An incidental take permit is also not required for recreational activities or management at the Lake. Thus, costs associated with changes to recreational activities or management are not anticipated or quantified in this analysis.

3.7 PROXIMITY TO A MAJOR ROAD

95. The Proposed Rule lists "proximity to a major road" as a threat to Subunit 3b, Westside Spring. In addition, a state highway passes along the border of Subunit 3a, Blue Hole Cienega/Blue Hole Fish Hatchery Ponds, and I-40 crosses unit 1a, Rancho del Padre Spring Cienega.

3.7.1 RANCHO DEL PADRE SPRING CIENEGA (1A)

96. The New Mexico Highways Department reports that the maintenance schedule for the Right-of-way for I-40 at Rancho del Padre Spring Cienega was altered several years ago

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[89] Personal communication with O. Hummel, Environmental Resources Section, USACE New Mexico, on May 21, 2007; Service, New Mexico Ecological Services Field Office, Final Fish and Wildlife Coordination Act Report for the Lea Lake Aquatic Habitat Restoration Feasibility Study at Bottomless Lakes State Park, Chavez County, New Mexico. Prepared for the U.S. Army Corps of Engineers. November 2006.

[90] See Service, New Mexico Ecological Services Field Office, Final Fish and Wildlife Coordination Act Report for the Lea Lake Aquatic Habitat Restoration Feasibility Study at Bottomless Lakes State Park, Chavez County, New Mexico. Prepared for the U.S. Army Corps of Engineers. November 2006.

[91] Service, Informal Consultation regarding the Bottomless Lake State Park Restoration Project, Cons #22420-2007-I-0007, October 27, 2007.

[92] Personal communication with O. Hummel, Environmental Resources Section, USACE New Mexico, on May 21, 2007

[93] Personal communication with S. Patterson, Bottomless Lakes State Park Manager, on June 14, 2007.

to avoid mowing the area during flowering season, but that no costs have been incurred as a result of this change.[94]

3.7.2 BLUE HOLE CIENEGA/BLUE HOLE FISH HATCHERY PONDS (3A)

97. As stated above, the State of New Mexico purchased the area known as Blue Hole Cienega in order to protect Pecos sunflower habitat.[95] The purchase was completed through a $75,000 grant from the Service and $75,000 from the New Mexico Department of Transportation.[96] While this area is now managed by the State Forestry Division, the State Highways Division continues to be responsible for the Right-of-way. State Foresters anticipate that the right-of-way will require some non-native species management efforts over the next 20 years. Therefore, this analysis assumes that grants similar to that currently held by the Forestry Department for non-native species removal efforts ($100,000) will be received by NMDOT for the right-of-way once every ten years over the next 20 years, totaling $200,000 (undiscounted) over 20 years.

3.7.3 WESTSIDE SPRING (3B)

98. Westside Spring does not appear to contain a right-of-way for a road. However, this area may be considered for purchase by the State Highways Department in order to protect the sunflower. However, there has been no confirmation from the state or the owners that this purchase is likely. Thus, no costs are included in the analysis.

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[94] Personal communication with S. Reed, New Mexico State Highway and Transportation Department on May 23, 2007

[95] "Oasis purchase could save endangered sunflower," Casper Star-Tribune, July 20, 2005 and May 16, 2007; Personal communication with R. Sivinski, Forestry Division, Energy, Minerals, and Natural Resources Department, State of New Mexico. May 24, 2007.

[96] Personal communication with S. Reed, New Mexico State Highway and Transportation Department on May 23, 2007; "Oasis purchase could save endangered sunflower," Casper Star-Tribune, July 20, 2005 and May 16, 2007.

REFERENCES

5 U.S.C. §601 et seq.

16 U.S.C. 1533.

16 U.S.C. §1533(b)(2).

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

773 F. 2d 327 (D.C. Cir. 1985).

Casper Star-Tribune. "Oasis purchase could save endangered sunflower," July 20, 2005 and May 16, 2007.

Center for Biological Diversity v. Bureau of Land Management (Case No. C-03-2509-SI, N.D. Cal.).

Data provided by Cibola County Assessor's Office, June 13, 2007.

Edwards Aquifer Authority. Comprehensive Water Management Plan, Adopted by the Board of Directors on December 14, 2004.

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

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

Gifford Pinchot Task Force v. United States Fish and Wildlife Service.

Gramlich, Edward M. A Guide to Benefit-Cost Analysis (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990.

Holmes, Sue M. "School of Natural Resources, From Earth to Sky and Everything In Between," Santa Fe New Mexican, Apr 23, 2007, accessed at http://www.freenewmexican.com/news/60642.html on July 2, 2007

http://www.ose.state.nm.us/water_info_groundwater_basin.html, accessed on July 2, 2007.

Intra Service Section 7 Biological Evaluation of purchase of Blue Hole Cienega property, 05-530, August 26, 2005.

Intraservice Section 7 Biological Evaluation, Application of insecticide Roundup/GlyphoMate 41, Ground, around irrigation pipelines, facilities, and structures, April 10, 2003, 03-309.

Jones, Ian C. "Cenozoic Pecos Alluvium Aquifer," Report 356, *Aquifers of West Texas*, edited by Robert E. Mace, William F. Mullican III and Edward S. Angle, December 2001.

Lower Pecos River Basin Water Master, District-Specific Regulations, New Mexico Office of the State Engineer, accessed at http://www.ose.state.nm.us/PDF/ActiveWater/LowerPecos/PecosFAQs-2006-03-10.pdf

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, accessed at http://www.whitehouse.gov/omb/memoranda/m01-27.html.

New Mexico Cattle Growers Ass'n v. U.S.F.W.S., 248 F.3d 1277 (10th Cir. 2001).

New Mexico Department of Game and Fish. "La Joya Waterfowl Area", accessed at http://www.wildlife.state.nm.us/conservation/wildlife_management_areas/documents/LaJoyaWA.pdf on July 2, 2007.

New Mexico Drinking Water Bureau data, accessed at http://eidea.state.nm.us/SDWIS/index.jsp on June 28, 2007.

Pecos River Water Rights Adjudication Settlement Agreement, March 25, 2003, accessed at http://www.seo.state.nm.us/water-info/pecos/settlement-03-25-2003.pdf

Pecos River Settlement Water Rights, 2006 Appropriations Bill, accessed at http://www.legis.state.nm.us/Sessions/06%20Regular/firs/SB0577.pdf

Personal communication with Albuquerque Ecological Services Office, Service, July 11, 2007.

Personal communication with C. Schultz, Natural Resources Manager, Laguna Pueblo, June 6, 2007.

Personal communication with D. Dodge, Community Development Officer, City of Santa Rosa, June 4, 2007.

Personal communication with former private landowner on June 6, 2007.

Personal communication with G. Pinkerton, Chaves County Planning and Zoning Department on May 23, 2007.

Personal communication with J. Hirsch, Department Lands Specialist, New Mexico Department of Game and Fish, on June 20, 2007.

Personal communications with J. Karges, Conservation Biologist, The Nature Conservancy, West Texas Office, on May 23, 2007, May 29, 2007, and June 29, 2007.

Personal communication with J. Wood, USACE Regulatory Branch, New Mexico, May 21, 2007.

Personal communication with L. Ulibarri, Assistant Refuge Manager, Bitter Lake National Wildlife Refuge, on June 21, 2007 and June 22, 2007.

Personal communication with M. Guston, New Mexico Department of Game and Fish on June 4, 2007.

Personal communication with M. Watson, New Mexico Department of Game and Fish on June 4, 2007.

Personal communication with O. Hummel, Environmental Resources Section, USACE New Mexico, on May 21, 2007

Personal communication with private landowner, June 6, 2007.

Personal communications with R. Charlie, Pueblo of Acoma, on June 13, 2007 and June 18, 2007.

Personal communication with R. Sivinski, Forestry Division, Energy, Minerals, and Natural Resources Department, State of New Mexico. May 24, 2007.

Personal communication with S. Patterson, Bottomless Lakes State Park Manager, on June 14, 2007.

Personal communication with S. Reed, New Mexico State Highway and Transportation Department on May 23, 2007.

Personal communication with T. Dodge, Community Development Officer, City of Santa Rosa, June 4, 2007.

Pub Law No. 104-121.

Public comments on the proposed critical habitat designation for the Pecos sunflower by Bruce Thompson, New Mexico Department of Game and Fish, January 9, 2008.

Public comments on the proposed critical habitat designation for the Pecos sunflower by Subhas Shah, Chief Engineer and CEO, Middle Rio Grande Conservancy District, Albuquerque, New Mexico, June 1, 2007.

Public comments on the proposed critical habitat designation for the Pecos sunflower by Chandler Chavez, Governor, Pueblo of Acoma, January 9, 2008.

Ridgley, Gregory C., Deputy Chief Counsel, Office of the State Engineer. "Status of Pecos River Settlement Agreement Implementation, Presentation to the Association of Western State Engineers," Association of Western State Engineers, Denver, Colorado, May 17, 2005, accessed at http://www.water.state.co.us/pubs/presentations/AWSE/gridgley.pdf

Robert Morris Associates. 2005. Annual Statement Studies, Financial Ratio Benchmarks, 2005-2006.

Sharp, John M. "Regional Groundwater Flow Systems in Trans-Pecos Texas," Report 356, *Aquifers of West Texas,* edited by Robert E. Mace, William F. Mullican III and Edward S. Angle, December 2001.

Sivinski, Robert. "New Mexico Status of *Helianthus paradoxus*, 1995 Progress Report, Section 6, Segment 10," Field Notes, 1995.

Sivinski, Robert. "Pecos Sunflower Conservation Agreements, 1997-1998 Progress Report, Section 6, Segment 10," Field Notes, September 30, 1998.

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

Texas Water Resources Education, Texas A&M University. "Texas Water Law," accessed at http://texaswater.tamu.edu/waterlaw.texas.htm on June 27, 2007.

The Nature Conservancy. "Diamond Y Spring Preserve", Informational fact sheet on Places We Protect, accessed at http://www.nature.org/wherewework/northamerica/states/texas/preserves/art13316.html on May 3, 2007.

U.S. Department of Interior. Attachment 3 Pesticide Use Proposal, R2-03-22510-07, dated April 3, 2003.

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.

U.S. Fish and Wildlife Service. Formal Section 7 Consultation with the Federal Emergency Management Agency (FEMA)'s Public Assistance Program.

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

U.S. Fish and Wildlife Service. "Pecos Sunflower (*Helianthus paradoxus*) Recovery Plan," September 2005.

U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office. Final Fish and Wildlife Coordination Act Report for the Lea Lake Aquatic Habitat Restoration Feasibility Study at Bottomless Lakes State Park, Chavez County, New Mexico. Prepared for the U.S. Army Corps of Engineers. November 2006.

U.S. Fish and Wildlife Service. 50 CFR Part 17, Proposed Designation of Critical Habitat for the Pecos Sunflower (*Helianthus paradoxus*); Proposed Rule. March 27, 2007.

U.S. Fish and Wildlife Service. Informal Consultation regarding the Bottomless Lake State Park Restoration Project, Cons #22420-2007-I-0007, October 27, 2007.

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.

APPENDIX A | SECTION 7 ADMINISTRATIVE CONSULTATION COSTS

99. This appendix presents administrative costs of consultations undertaken according to section 7 of the Act associated with the areas proposed for critical habitat designation for the sunflower, as well as for areas proposed for exclusion from critical habitat. First, this Appendix defines the types of administrative costs quantified. Next, it presents the estimated number of pre-designation and post-designation consultations by activity and subunit.

A.1 CATEGORIES OF CONSULTATIONS

100. Section 7(a)(2) of the Act requires Federal agencies to consult with the Service whenever activities that they undertake, authorize, permit, or fund may affect a listed species or designated critical habitat. In some cases, consultations will involve the Service and another Federal agency only, such as the U.S. Army Corps of Engineers. Consultations may also include a third party involved in projects on non-Federal lands with a Federal nexus, such as state agencies and private landowners.

101. During a consultation, the Service, the Federal agency, and the third party applying for Federal funding or permitting (if applicable) communicate in an effort to minimize potential adverse effects to the species and/or to the proposed critical habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, and the potential effects to the species and designated critical habitat associated with the activity that has been proposed, the Federal agency, and whether there is a private applicant involved.

102. Section 7 consultations with the Service may be either informal or formal. *Informal consultations* consist of discussion between the Service, the Federal agency, and the applicant concerning an action that may affect a listed species or its designated critical habitat. The process is designed to identify and resolve potential concerns at an early stage in the planning process. By contrast, a *formal consultation* is required if the Federal agency determines that its proposed action may or will adversely affect the listed species or designated critical habitat in ways that cannot be resolved through informal consultation. The formal consultation process results in the Service's determination in a Biological Opinion of whether the action is likely to jeopardize a species or adversely modify critical habitat, and recommendations to minimize those impacts. Regardless of

the type of consultation or proposed project, section 7 consultations can require substantial administrative effort on the part of all participants.

A.2 ESTIMATED COSTS OF CONSULTATIONS AND TECHNICAL ASSISTANCE

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

104. The administrative costs estimates presented in this section take into consideration the level of effort of the Service, the Federal agency, and the applicant, as well as the varying complexity of the consultation. Costs associated with these consultations include the administrative costs associated with conducting the consultations, such as the costs of time spent in meetings, preparing letters, and the development of a biological opinion. Exhibit A-1 provides a summary of the estimated administrative costs per consultation effort.

EXHIBIT A-1 ESTIMATED ADMINISTRATIVE COSTS OF CONSULTATION (PER EFFORT), 2007$

CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT
Informal	$2,250	$2,900	$2,050	$2,000
Formal	$5,050	$5,750	$3,500	$4,800

Source: IEc analysis based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2006, and a review of consultation records from several Service field offices across the country.
Note: Estimates reflect average hourly time required by staff.

A.3 SUMMARY OF PAST ADMINISTRATIVE COSTS

105. Since the listing of the sunflower in 1999, there have been approximately 17 consultations on the sunflower, of which five were formal and 12 were informal. The majority of these actions were internal consultations with the Service regarding the Bitter Lake NWR and Bitter Lake NWR Farm (13 consultations). The remaining four consultations were miscellaneous consultations regarding various land management activities, including a statewide FEMA public assistance program. These consultations are detailed in Exhibit A-2. Costs associated with these consultations are included in Exhibits A-4.

A.4 SUMMARY OF FUTURE ADMINISTRATIVE COSTS

106. This analysis forecasts informal and formal consultations by activity based on review of historical consultations, and research regarding future projects within the potential critical habitat area. Over the next 20 years, this analysis estimates approximately $0.7 million in undiscounted dollars (present value of $0.3 million applying a seven percent discount rate or $0.5 million applying a three percent discount rate) in administrative costs in areas proposed for designation. These future consultations break down by activity and subunit as described in Exhibit A-3. Costs associated with these consultations are included in Exhibits A-4.

107. The number of forecast consultations within the study area is based on the following assumptions:

- **Internal Service Consultations**: *31 consultations.* At Bitter Lake NWR and Bitter Lake NWR Farm (subunits 4a and 4b), consultations with the Service are estimated using the past rate of consultation. Additional consultations are estimated for state-owned lands in proposed critical habitat areas where a Federal nexus exists.
- **USACE:** *four consultations.* A single consultation with the USACE is estimated for each private parcel within proposed critical habitat where development activity may occur. This analysis does not forecast specific development projects across the designation but instead provides information on the value of the development option of the lands within potential critical habitat. An additional consultation with USACE is estimated to occur at Lea Lake (Subunit 4d), where one large consultation occurred with USACE in the past.
- **Other Agencies:** *six consultations.* One consultation with the U.S. Department of Transportation is estimated for Westside Spring (Subunit 3b). Five miscellaneous consultations are estimated to occur that cover multiple units based on the past consultation history (for example, to cover FEMA's disaster-relief public assistance program).

108. The number of estimated post-designation consultations for activities within a given subunit is highly uncertain. The frequency of such efforts will be related to the level of economic activity in each subunit.

EXHIBIT A-2 PAST CONSULTATION NUMBERS WITHIN PROPOSED CRITICAL HABITAT BY SUBUNIT AND ACTIVITY, 1999-2006

UNIT/SUBUNIT	TYPE OF ACTION	SERVICE	USACE	OTHER	TOTAL
3a Blue Hole Cienega/Blue Hold Fish Hatchery Ponds	Formals	1			1
	Informals				0
	Subtotal				**1**
4b Bitter Lake NWR	Formals	2	2		
	Informals	9	9		
	Subtotal		**11**		
4b Bitter Lake NWR Farm	Formals		0		
	Informals	2	2		
	Subtotal		**2**		
4d Lea Lake at Bottomless Lakes SP	Formals				0
	Informals		1		1
	Subtotal				**1**
Multiple Units*	Formals			2	2
	Informals				0
	Subtotal				**2**
Total Past Actions	**Formals**	**3**	**2**	**2**	**7**
	Informals	**11**	**13**	**-**	**24**
	Total Actions	**14**	**15**	**2**	**31**

*Indicates that these costs will be split across more than one unit in the designation.

EXHIBIT A-3 FUTURE CONSULTATION NUMBERS WITHIN PROPOSED CRITICAL HABITAT BY SUBUNIT AND ACTIVITY, 1999-2006

UNIT/SUBUNIT	TYPE OF ACTION	SERVICE	USACE	OTHER	TOTAL
1a Rancho del Padre Spring Cienega	Formals		1		1
	Informals				0
	Subtotal				**1**
1b Grants Salt Flat Wetland	Formals		1		1
	Informals				0
	Subtotal				**1**
1c Pueblo of Laguna	Formals		1		1
	Informals				0
	Subtotal				**1**
2 La Joya State WMA	Formals	2			2
	Informals				0
	Subtotal				**2**
3a Blue Hole Cienega/Blue Hold Fish Hatchery Ponds	Formals	1			1
	Informals				0
	Subtotal				**1**
3b Westside Spring	Formals			1	1
	Informals				0
	Subtotal				**1**
4a Bitter Lake NWR/ City of Roswell Land	Formals	4			4
	Informals	19			19
	Subtotal				**23**
4b Bitter Lake NWR Farm	Formals	4			4
	Informals				0
	Subtotal				**4**
4c Oasis Dairy	Formals				0
	Informals				0
	Subtotal				**0**
4d Lea Lake at Bottomless Lakes SP	Formals	1	1		2
	Informals				0
	Subtotal				**2**

UNIT/SUBUNIT	TYPE OF ACTION	SERVICE	USACE	OTHER	TOTAL
4e Dexter Cienega	Formals				0
	Informals				0
	Subtotal				**0**
5 Diamond Y Spring	Formals				0
	Informals				0
	Subtotal				**0**
Multiple Units*	Formals			5	5
	Informals				0
	Subtotal				**5**
Total	**Formals**	**12**	**4**	**6**	**22**
	Informals	**19**	**-**	**-**	**19**
	Total Future Actions	**31**	**4**	**6**	**41**

*Indicates that these costs will be split across more than one unit in the designation.

EXHIBIT A-4 PAST AND POTENTIAL FUTURE CONSULTATION COSTS WITHIN PROPOSED CRITICAL HABITAT BY SUBUNIT

UNIT	NAME	PAST COSTS (2007$) 1999-2006	FUTURE COSTS (UNDISCOUNTED)	FUTURE COSTS (3 PERCENT)	FUTURE COSTS (7 PERCENT)
1a	Rancho del Padre Spring Cienega	$0	$20,000	$15,000	$11,000
1b	Grants Salt Flat Wetland	$0	$20,000	$15,000	$11,000
1c	Pueblo of Laguna	$0	$20,000	$15,000	$11,000
2	La Joya State Wildlife Management Area	$0	$40,000	$30,000	$21,000
3a	Blue Hole Cienega/Blue Hole Fish Hatchery Ponds	$20,000	$20,000	$15,000	$11,000
3b	Westside Spring	$0	$20,000	$15,000	$11,000
4a	Bitter Lake NWR/City of Roswell Land	$148,000	$266,000	$198,000	$141,000
4b	Bitter Lake NWR Farm	$20,000	$80,000	$60,000	$43,000
4c	Oasis Dairy	$0	$20,000	$15,000	$11,000
4d	Lea Lake at Bottomless Lakes State Park	$10,000	$40,000	$30,000	$21,000
4e	Dexter Cienega	$0	$0	$0	$0
5	Diamond Y Spring	$0	$0	$0	$0
	Multiple Units*	$40,000	$100,000	$75,000	$53,000
	TOTAL	$237,000	$648,000	$483,000	$345,000

Note: Table may not sum due to rounding.

***Indicates that these costs will be split across more than one unit in the designation.**

APPENDIX B | INCREMENTAL ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE PECOS SUNFLOWER

109. This appendix estimates the potential incremental impacts of critical habitat designation for the Pecos sunflower. It does so by attempting to isolate those direct and indirect impacts discussed in this report that are expected to be triggered specifically by the critical habitat designation. That is, the incremental conservation efforts and associated impacts included in this appendix would not be expected to occur absent the designation of critical habitat for the species.

110. As described in detail in Section B.3 of this appendix, the incremental impacts of critical habitat designation for the Pecos sunflower are forecast to be $605,000 (present value at a three percent discount rate). These incremental impacts are associated with administrative costs of consultation above and beyond those impacts expected to occur due to the listing of the species. All remaining impacts quantified in the main text of this report are forecast to occur regardless of critical habitat designation for the Pecos sunflower.

B.1 BACKGROUND

111. 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."[97] 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.

112. 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 coextensively to other causes.[98] Specifically, the court stated

[97] OMB, "Circular A-4," September 17, 2003.

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

> "The statutory language is plain in requiring some kind of consideration of economic impact in the CHD 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 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."[99]

113. 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.[100] For example, In the March 2006 court order 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,

114. "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.'"[101]

115. 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 fully co-extensive impacts associated with the proposed critical habitat designation (in the main text of the report); and b) the subset of these impacts that are identified as incremental to the rulemaking, precipitated specifically by the designation of critical habitat for the species (in this appendix).

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

[100] *Cape Hatteras Access Preservation Alliance v. Department of Interior,* 344 F. Supp. 2d 108 (D.D.C.); CBD v. BLM, 422 F. Supp/. 2d 1115 (N.D. Cal. 2006).

[101] Center for Biological Diversity et al, Plaintiffs, v. 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.

116. Until a new regulation is adopted to define "destruction or adverse modification," 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 would be imposed as a result of critical habitat designation over and above those associated with the listing.[102] The following section describes the methods employed to identify incremental impacts anticipated to result from the designation of critical habitat.

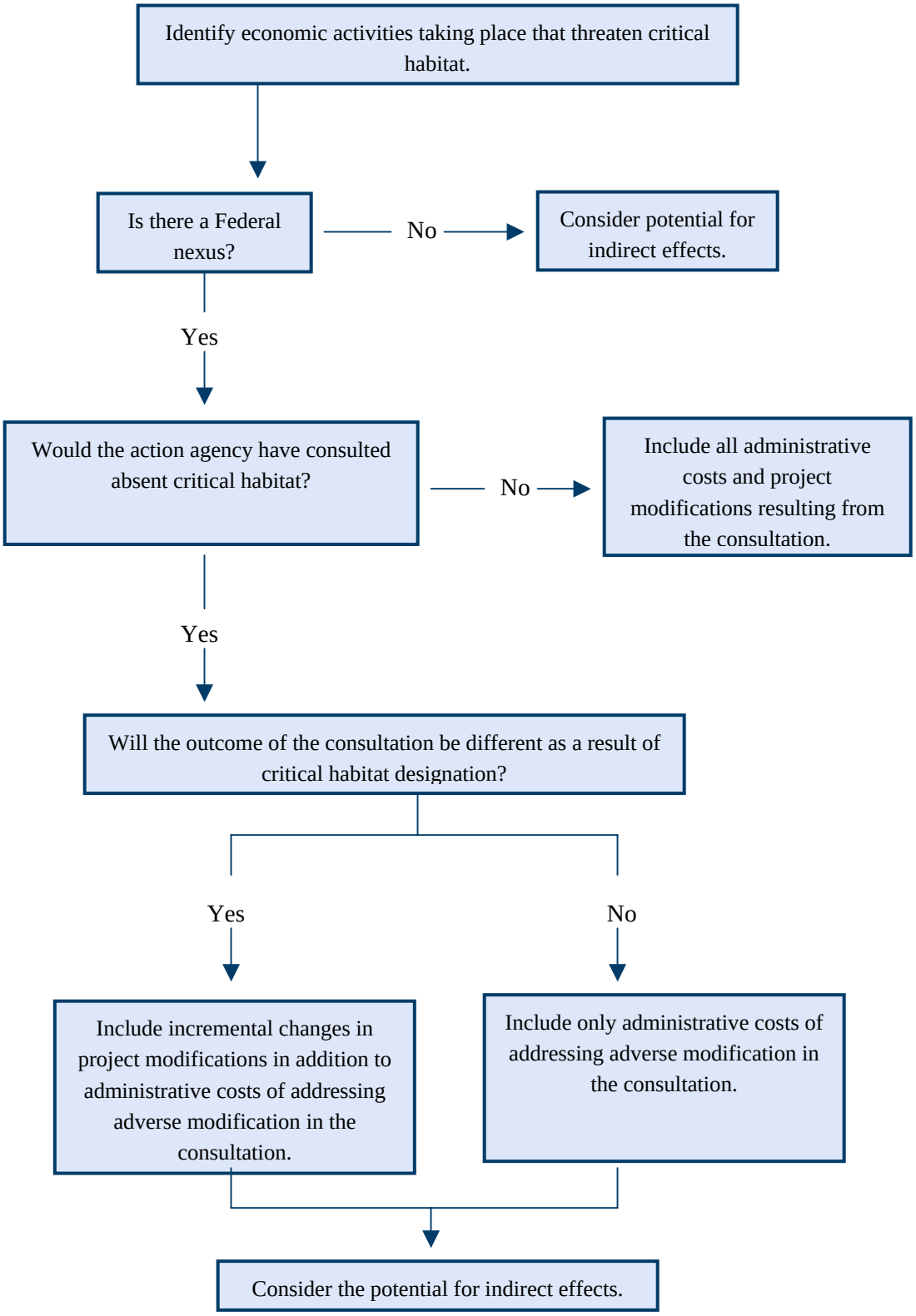
B.2 FRAMEWORK FOR THE INCREMENTAL ANALYSIS

117. This section provides a description of the methodology used to determine potential economic impacts stemming from the proposed designation of critical habitat for the Pecos sunflower. The analysis evaluates impacts in a "with critical habitat designation" versus a "without critical habitat designation" framework, measuring the net change in economic activity. The "without critical habitat designation" scenario, which represents the baseline for this incremental analysis, includes all protection already afforded the species under State, local, and Federal laws, existing conservation plans, and the listing of the species under the Act. The focus of this 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.

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

[102] 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.

EXHIBIT B-1 IDENTIFYING INCREMENTAL IMPACTS OF CRITICAL HABITAT DESIGNATION



B.2.1 DEFINING THE BASELINE

119. The baseline for this incremental 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. Section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. The administrative costs of consultations under the jeopardy standard, along with the impacts of project modifications resulting from these consultations, are considered baseline impacts.

120. In addition to impacts associated with section 7 of the Act, the baseline includes impacts of compliance with other Sections of the Act, as well as other Federal, State, and local laws that protect the species in the absence of critical habitat designation. If the Clean Water Act, for example, protects wetland habitat for the species, relevant impacts of Clean Water Act compliance are considered part of the baseline.

121. The baseline represents the best estimate of the "world without critical habitat," and therefore 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.

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

B.2.2 QUANTIFYING INCREMENTAL ECONOMIC IMPACTS

123. The incremental impacts of the proposed critical habitat designation are a subset of the co-extensive economic impacts quantified in the main text of this report. Incremental impacts may be the direct compliance costs associated with additional effort for 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 habitat conservation plans (HCPs) specifically to avoid designation of critical habitat), triggering of additional requirements under State or local laws intended to protect sensitive habitat, and uncertainty and perceptional effects on markets.

Direct Impacts

124. 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, compensate for, or mitigate potential destruction or adverse modification of critical habitat.

Administrative Section 7 Consultation Costs

125. 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.

126. 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.

127. 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 outcome of each future consultation in terms of level of effort. Review of consultation records and discussions with Service field offices resulted in an estimated range of administrative costs of consultation as highlighted in Exhibit B-2.

EXHIBIT B-2 RANGE OF ADMINISTRATIVE CONSULTATIONS COSTS, 2006$

CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT
Informal	$1,100 - $3,400	$1,500 - $4,300	$1,200 - $2,900	$0 - $4,000
Formal	$3,400 - $6,700	$4,300 - $7,200	$2,900 - $4,100	$4,000 - $5,600

Source: IEc analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2006, and a review of consultation records from several Service field offices across the country conducted in 2002.
Note: Estimates reflect average hourly time required by staff.

128. The above ranges in consultation costs represent effort required for all types of consultation, including those that considered both adverse modification and jeopardy, and are therefore not representative of the incremental administrative costs of consultation triggered specifically by critical habitat designation. To estimate the fraction of the administrative costs associated with consultation the following assumptions were applied.

- The costs of an incremental consultation (one only occurring because of the designation of critical habitat) are the greatest, as all costs associated with this consultation are included.
- Re-initiation of a consultation is assumed to require approximately half the level of effort of the incremental consultation. 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.
- Efficiencies exist with 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 that will already be required to consider jeopardy result in the least incremental effort of these three consultation categories, roughly half that of a re-initiation.

129. The cost model in Exhibit B-3 presents the estimated incremental costs of consultation for each of the three categories of consultation described above. Importantly, the

estimated costs represent the midpoint of the ranges in Exhibit B-2 to account for variability regarding levels of effect of specific consultation.[103]

EXHIBIT B-3 ESTIMATED ADMINISTRATIVE COSTS OF CONSULTATION (PER EFFORT), 2007$

CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT
INCREMENTAL CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION				
Informal	$2,320	$2,990	$2,110	$2,060
Formal	$5,200	$5,920	$3,610	$4,940
RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION				
Informal	$1,150	$1,490	$1,050	$1,030
Formal	$2,600	$2,960	$1,800	$2,470
ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION				
Informal	$580	$750	$530	$520
Formal	$1,300	$1,470	$900	$1,240

Source: IEc analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2006, and a review of consultation records from several Service field offices across the country conducted in 2002. Rates have been inflated to $2007.
Notes:
1. Estimates reflect average hourly time required by staff.

Section 7 Project Modification Impacts

130. 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, economic impacts of project modifications undertaken to avoid, compensate for, or mitigate 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 associated solely with avoiding, compensating for, or minimizing adverse modification are considered incremental.

2. **Re-initiation of consultation to address adverse modification -** Only project modifications associated solely with avoiding, compensating for, or mitigating adverse modification are considered incremental.

[103] Absent specific information on the probability that a consultation will be closer to the low or high end of the range, presenting the midpoint effectively assumes there is an even distribution of the consultation falling at any given point on the spectrum between the low-end cost and high-end cost.

3. **Incremental consultation resulting entirely from critical habitat designation -** Impacts of all project modifications are considered incremental.

Indirect Impacts

131. 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 economic behavior that may occur outside of the Act, through other Federal, State, or local actions, 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.

Habitat Conservation Plans

132. Under section 10(a)(1)(B) of the Act, a non-Federal entity (i.e., a landowner or local government) may develop an HCP for an endangered animal species in order to meet the conditions for issuance of an incidental take permit in connection with the development and management of a property. The HCP intends to counterbalance potential harmful effects that a proposed activity may have on a species, while allowing the otherwise lawful activity to proceed. As such, the purpose of the habitat conservation planning process is to ensure that the effects of incidental take are adequately minimized and mitigated. Thus, HCPs are developed to ensure compliance with section 9 of the Act and to meet the requirements of section 10 of the Act.

133. HCPs are not required or necessarily recommended by a critical habitat designation. Some landowners, however, may voluntarily complete a HCP in response to the prospect of having their land designated as critical habitat. 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

134. 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.

135. The California Environmental Quality Act (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 Environmental Impact Report 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

136. In addition to the indirect effects of compliance with other laws or triggered by the designation, project proponents, land managers and landowners may face additional indirect impacts, including the following:

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

B.3 INCREMENTAL ANALYSIS OF CRITICAL HABITAT FOR THE PECOS SUNFLOWER

137. Exhibit B-4 summarizes the co-extensive impacts quantified in the main text of this analysis, and details whether, according to the framework described above, each impact is considered to be a baseline or incremental impact. Total baseline impacts of Pecos sunflower conservation are forecast to be $2.6 million to $3.0 million (present value at a

three percent discount rate. Importantly, these baseline impacts are not expected to be affected by decisions made regarding the final critical habitat designation for the Pecos sunflower; they are expected to occur absent any critical habitat designation for the species. Total incremental impacts of critical habitat designation are forecast to be $605,000 (present value at a three percent discount rate).

138. Exhibit B-4 highlights that, in general, future consultations on Pecos sunflower within proposed critical habitat areas are expected to require some level of additional effort for consideration of impacts to critical habitat. In addition, critical habitat is anticipated to cause economic impacts associated with development activities and Tribal management efforts, including livestock management. On the other hand, all of the impacts associated with non-native species management activities on non-Tribal lands are assumed to be baseline costs of the sunflower. In other words, critical habitat designation for the sunflower is not expected to result in modifications to non-native species management activities above and beyond those that are already likely to occur under the listing of the species.

139. Exhibit B-5 distributes the estimated incremental impacts across the proposed critical habitat units for the Pecos sunflower. As well as having the largest baseline costs, designation of Bitter Lake NWR (Unit 4a) is expected to trigger the greatest incremental impacts, comprising 33 percent of total forecast incremental impacts.

EXHIBIT B-4 INCREMENTAL IMPACTS OF CRITICAL HABITAT DESIGNATION FOR THE PECOS SUNFLOWER

DESCRIPTION OF IMPACT QUANTIFIED IN CO-EXTENSIVE ANALYSIS (MAIN TEXT OF REPORT)	BASELINE IMPACT (PRESENT VALUE, 3%)	INCREMENTAL IMPACT (PRESENT VALUE, 3%)	REASON
ENCROACHMENT BY NON-NATIVE SPECIES			
• La Joya WMA, mechanical treatment of non-native plants in place of aerial spraying; • Blue Hole Cienega, non-native species eradication efforts; • Bitter Lake NWR/NWR Farm, Best Management Practices, water manipulations, dike maintenance, non-native species removals, prescribed fire, biological monitoring, avoidance of areas for mowing, road maintenance.	$2.3 to $2.7 million	$0	Efforts to eradicate non-native species have been ongoing on state and Federal lands within proposed critical habitat. Thus, these efforts are likely to continue regardless of designation of critical habitat for the Pecos sunflower. As such, they are considered to be baseline costs.
WETLAND FILLING AND DEVELOPMENT			
• Potential costs to private landowners of avoiding development activities in proposed areas, essentially reducing property values.	$0	$290,000	The analysis quantifies potential impacts on property values that could occur due to possible limitations on development capacity within critical habitat boundaries. If these impacts were to occur following critical habitat designation, it would be difficult to determine with certainty whether the impact was caused by critical habitat or the presence of the species. Thus, the analysis conservatively includes these costs under potential incremental impacts of critical habitat designation.
INCOMPATIBLE LIVESTOCK MANAGEMENT			
• Only costs associated with Tribal efforts to control impacts of livestock on Pecos sunflower are included, as other private landowners are not anticipated to voluntarily change current practices.	$0	$196,000	The draft management plan for the Laguna Tribe was completed prior to designation of critical habitat for the sunflower, but the plan was finalized in time for the close of public comment period for the critical habitat designation. It appears, therefore, that the potential for designating critical habitat on Laguna lands may have encouraged the completion of the management plan. The management plan includes efforts to monitor the species as well as reduce impacts of livestock. As such, these costs are attributed to critical habitat designation. While no management plan has been received for the Acoma Tribe to date, the analysis assumes that any costs of sunflower management borne by the Pueblo of Acoma would not have occurred without critical habitat designation, and therefore can be attributed to the critical habitat designation.

DESCRIPTION OF IMPACT QUANTIFIED IN CO-EXTENSIVE ANALYSIS (MAIN TEXT OF REPORT)	BASELINE IMPACT (PRESENT VALUE, 3%)	INCREMENTAL IMPACT (PRESENT VALUE, 3%)	REASON
ADMINISTRATIVE COSTS			
• 22 formal consultations and 19 informal consultations	$364,000	$119,000	In general, future consultations on Pecos sunflower within proposed critical habitat areas are expected to require additional effort for consideration of impacts to critical habitat. Thus, a portion of the total coextensive administrative costs related to Pecos sunflower are attributed to critical habitat designation.
TOTALS	**$2.6 to $3.0 million**	**$605,000**	

* Personal communications with Southwestern Regional Office and Albuquerque Ecological Field Services Office, U.S. Fish and Wildlife Service Field Office, January 24, 2008.

EXHIBIT B-5 INCREMENTAL IMPACTS OF CRITICAL HABITAT BY UNIT

UNIT		FUTURE (UNDISCOUNTED DOLLARS)	FUTURE PRESENT VALUE 3%	FUTURE PRESENT VALUE 7%
1a	Rancho del Padre Spring Cienega	$144,000	$130,000	$118,000
1b	Grants Salt Flat Wetland	$211,000	$210,000	$209,000
1c	Pueblo of Laguna	$5,000	$4,000	$3,000
2	La Joya State Wildlife Management Area	$10,000	$7,000	$5,000
3a	Blue Hole Cienega/Blue Hole Fish Hatchery Ponds	$5,000	$4,000	$3,000
3b	Westside Spring	$5,000	$4,000	$3,000
4a	Bitter Lake NWR/City of Roswell Land	$270,000	$202,000	$145,000
4b	Bitter Lake NWR Farm	$20,000	$15,000	$10,000
4c	Oasis Dairy	$5,000	$4,000	$3,000
4d	Lea Lake at Bottomless Lakes State Park	$10,000	$7,000	$5,000
4e	Dexter Cienega	$0	$0	$0
5	Diamond Y Spring	$0	$0	$0
	Multiple	$25,000	$18,000	$13,000
	TOTAL	**$709,000**	**$605,000**	**$517,000**

APPENDIX C | SMALL BUSINESS ANALYSIS AND ENERGY IMPACT ANALYSIS

140. This appendix considers the extent to which the impacts discussed in the previous Sections could be borne by small businesses and the energy industry. The analysis presented in Section C.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), U.S. Census Bureau, and the Risk Management Association (RMA). The energy analysis in Section C.2 is conducted pursuant to Executive Order No. 13211.

C.1 IMPACTS TO SMALL ENTITIES

141. When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).[104] No initial regulatory flexibility analysis (IRFA) is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities. To assist in this process, this appendix provides a screening level analysis of the potential for sunflower conservation efforts to affect small entities.

C.1.1 SUMMARY OF IMPACTS ON SMALL ENTITIES

142. This screening analysis is based on the estimated impacts associated with the proposed rulemaking as described in Section 3 of this analysis. The analysis identifies potential impacts on the following activities:

- Treatment of non-native species;
- Wetland filling and development;
- Livestock management;
- Road maintenance.

143. Activities related to the treatment of non-native species and road maintenance activities are not anticipated to affect small entities as these activities will be carried out by state or

[104] 5 U.S.C. 601 et seq.

Federal agencies. Impacts to livestock management are anticipated on lands owned by the Acoma and Laguna Pueblos. Potential impacts to these Tribes are detailed in Section 3.

144. This screening analysis therefore focuses on economic impacts resulting from modifications to wetland filling and development activities. Exhibit C-1 summarizes the estimated impacts to small entities described in detail in the remainder of this appendix.

EXHIBIT C-1 SUMMARY OF IMPACTS TO SMALL ENTITIES

ACTIVITY	TOTAL NUMBER OF AFFECTED SMALL ENTITIES	PERCENTAGE OF TOTAL SMALL ENTITIES THAT ARE EXPECTED TO BE AFFECTED	ESTIMATED IMPACT PER SMALL ENTITY	PERCENTAGE IMPACT PER SMALL ENTITY
Construction and Development	1 developer	20 percent of all small developers	$290,000	5 percent of total sales

C.1.2 DETAILED ANALYSIS OF IMPACTS TO SMALL ENTITIES

145. This analysis 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.

146. The Act requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable. Section 4(b)(2) of the Act requires that the Service designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts, of specifying any particular area as critical habitat." This section grants the Secretary [of Interior] the power 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 so doing "will result in the extinction of the species."

147. 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. Depending upon state laws, it may be difficult to distinguish whether a small entity is a government or non-profit entity. For example, a water supply entity may be a cooperative owned by its members in one case and in another a publicly chartered small government with the assets owned publicly and officers elected at the same elections as other public officials.

148. The courts have held that the RFA/SBREFA 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 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 affected within the definition of the RFA.[105]

149. 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.[106] 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 affected within the definition of the RFA.

[105] 773 F. 2d 327 (D.C. Cir. 1985).

[106] 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

150. 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.[107] "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."[108]

151. 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 fund or permit may be proposed or carried out by small entities. Given the SBA guidance described above, this screening 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. The small entities described in this appendix are not considered to be directly regulated by the Service through Section 7.

152. This screening analysis focuses on small entities that may bear the regulatory costs quantified in Section 3 of this economic analysis. Of the affected activities discussed in the economic analysis, only impacts to wetland filling and development activities are forecast to be borne in part by small entities.

Economic Impact of Compliance Requirements on Small Entities

153. Section 3 of this analysis details potential impacts of sunflower conservation efforts on private development in two units (Rancho del Padre Spring Cienega and Grants Salt Flat Wetland). If owners of parcels containing designated critical habitat face land use restrictions that preclude development on some or all of the parcel, the value of the properties will be reduced, essentially eliminating the option that those portions of the parcels be developed. Where development is the most likely future land use, the current market value of these lands is assumed to reflect the full option value for future development.

154. To understand to what extent these potential impacts may be experienced by small entities, this analysis assumes that the two developable private lands in proposed critical habitat in Cibola County are currently owned by developers. This analysis further assumes that impacts of sunflower conservation efforts (e.g., avoiding the area for

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

[108] *Ibid.*, pg. 21.

development purposes) will be borne by these developers.[109] This assumption may overestimate the number of affected small entities as the affected landowners may not be developers, but individuals or families that are not registered businesses (e.g., individuals holding the land as an investment).[110]

155. Exhibit C-2 describes the characteristics of developers in the potentially affected region, Cibola County.

EXHIBIT C-2 CHARACTERISTICS OF DEVELOPERS IN CIBOLA COUNTY

NAICS CODE	NUMBER OF DEVELOPERS	NUMBER OF SMALL DEVELOPERS	PERCENT SMALL DEVELOPERS
236115 - New Single-Family Housing Construction	4	4	100%
236116 - New Multifamily Housing Construction (except Operative Builders)	0	0	-
236117 - New Housing Operative Builders	0	0	-
237210 - Land Subdivision	1	1	100%
Total	**5**	**5**	**100%**

Source: Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifiers," on July 18, 2007.

156. This analysis assumes that, in a high-end scenario, the entirety of forecast impacts would be borne by one small developer. The one small developer estimated to be affected represents approximately 20 percent of total small developers in the region.

157. As described in Section 3, the total impact resulting from land use restrictions on development activities is forecast to be, at most, $290,000, or approximately $20,000 annually. Assuming the annual revenues of an average small developer in Cibola County are $400,000,[111] the total forecast impacts would represent approximately five percent of typical annual sales.

[109] As described in Chapter 3, before purchasing a parcel the developer will consider the regulatory restrictions associated with that parcel. Therefore, any costs associated with conservation efforts for the CSI will be reflected in the price paid for the parcel. Thus, the costs of CSI conservation efforts are ultimately borne by the current landowner in the form of reduced land values.

[110] North American Industry Classification System (NAICS) code exists for landowners, and SBA does not provide a definition of small landowner.

[111] This figure is based on the posted 2003 and 2005 revenues for W. McBride Construction in Grants, NM. 2007 Dun and Bradstreet Market Identifiers, 2007.

C.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

158. Pursuant to Executive Order No. 13211, "Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use," issued May 18, 2001, Federal agencies must prepare and submit a "Statement of Energy Effects" for all "significant energy actions." The purpose of this requirement is to ensure that all Federal agencies "appropriately weigh and consider the effects of the Federal Government's regulations on the supply, distribution, and use of energy."[112]

159. The Office of Management and Budget provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute "a significant adverse effect" when compared with the regulatory action under consideration:

- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
- Reductions in fuel production in excess of 4,000 barrels per day;
- Reductions in coal production in excess of 5 million tons per year;
- Reductions in natural gas production in excess of 25 million Mcf per year;
- Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
- Increases in energy use required by the regulatory action that exceed the thresholds above;
- Increases in the cost of energy production in excess of one percent;
- Increases in the cost of energy distribution in excess of one percent; or
- Other similarly adverse outcomes.[113]

160. As none of these criteria is relevant to this analysis, energy-related impacts associated with conservation efforts within the potential critical habitat are not expected.

[112] 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.

[113] Ibid.