



## ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE GUNNISON SAGE-GROUSE

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prepared for:

U.S. Fish and Wildlife Service  
4401 N. Fairfax Drive  
Arlington, VA 22203

prepared by:

Industrial Economics, Incorporated  
2067 Massachusetts Avenue  
Cambridge, MA 02140  
617/354-0074

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**LIST OF ACRONYMS AND ABBREVIATIONS**

Act	Endangered Species Act
AUM	Animal unit month
BEBR	Bureau of Economic and Business Research
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CCA	Candidate Conservation Agreement
CCAA	Candidate Conservation Agreement with Assurances
CDOT	Colorado Department of Transportation
CERI	Colorado Energy Research Institute
COGCC	Colorado Oil and Gas Conservation Commission
Corps	U.S. Army Corps of Engineers
CPW	Colorado Parks and Wildlife
CRP	Conservation Reserve Program
CWA	Clean Water Act
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
FSA	Farm Service Agency
GMUG	Grand Mesa, Uncompahgre, and Gunnison (National Forests)
HCP	Habitat Conservation Plan
NAICS	North American Industry Classification System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
OMB	U.S. Office of Management and Budget
RCP	Rangewide Conservation Plan

RFA	Regulatory Flexibility Act
RMP	Resource Management Plan
Sage-grouse	Gunnison sage-grouse
SBA	Small Business Administration
SBREFA	Small Business Regulatory Enforcement Fairness Act
Service	U.S. Fish and Wildlife Service
SGI	Sage-grouse Initiative
TMP	Travel Management Plan
UMRA	Unfunded Mandates Reform Act
USFS	U.S. Forest Service
WCD	Water Conservancy District

## EXECUTIVE SUMMARY

1. The purpose of this report is to evaluate the potential economic impacts associated with conservation of the Gunnison sage-grouse (*Centrocercus minimus*) (hereafter, sage-grouse). This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service (Service).
2. The Service published the Proposed Rule for the designation of critical habitat for the sage-grouse on January 11, 2013.<sup>1</sup> The proposed critical habitat designation spans seven units in Colorado and Utah, totaling approximately 1.7 million acres. Of the proposed acreage, approximately 937,765 acres are considered occupied by the species, and the remaining 766,462 acres are considered unoccupied.

### FRAMEWORK FOR THE ANALYSIS

3. This analysis estimates economic impacts of sage-grouse conservation efforts associated with the following categories of economic activity:
  - Livestock grazing;
  - Agriculture and water management;
  - Mineral and fossil fuel extraction;
  - Residential and related development;
  - Renewable energy development;
  - Recreation; and
  - Transportation activities.

We estimate economic impacts from 2013 (expected year of final critical habitat designation) to 2032 (a 20-year period of analysis). This 20-year analysis period reflects the maximum amount of time under which future activities and economic impacts associated with the Proposed Rule can be reliably projected, given available data and information.

4. This analysis characterizes all projected impacts as either baseline costs (i.e., those impacts expected to occur absent the designation of critical habitat) or incremental impacts (i.e., those impacts expected to occur as a result of critical habitat designation). The Service provides guidance on distinguishing the incremental impacts of the designation, as described in greater detail in Chapter 2 of the report. In summary, this

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<sup>1</sup> 2013 Proposed Rule, 78 FR 2540.

analysis assigns costs to the baseline or incremental scenarios based on the location of future projects within occupied habitat (assumed to result in baseline impacts) or unoccupied habitat (assumed to result in incremental impacts). The Service believes that the types of conservation efforts required to avoid jeopardy to the species will be similar to those required to avoid adverse modification of critical habitat, except in cases where an activity is likely to result in “significant alteration of habitat.”<sup>2</sup> We do not forecast any projects where we believe significant alteration of habitat is likely. Therefore, we do not forecast impacts associated with additional types of conservation efforts. We do, however, forecast incremental impacts associated with implementation of conservation efforts in unoccupied habitat, where such efforts would not be requested absent the designation of critical habitat.

#### KEY FINDINGS

5. Exhibit ES-1 summarizes the total impacts likely to occur if all of the units proposed are designated as critical habitat. Absent the designation of critical habitat, conservation efforts benefitting the sage-grouse and its habitat will be undertaken due to the listing under the Act and existing management strategies. We forecast baseline impacts of \$9.7 million (present value over 20 years), discounted at seven percent, or \$12 million (present value over 20 years), discounted at three percent. Annualized baseline impacts are forecast to be \$850,000 at a seven percent discount rate or \$810,000 at a three percent discount rate.
6. Quantified incremental impacts anticipated to result solely from this designation are \$3.8 million (present value over 20 years), assuming a seven percent discount rate. If we assume the social rate of time preference is three percent, quantified incremental impacts are \$4.7 million (present value over 20 years). Annualized incremental impacts of critical habitat designation are forecast to be \$340,000 at a seven percent discount rate or \$310,000 at a three percent discount rate.

**EXHIBIT ES-1. SUMMARY OF FORECAST ECONOMIC IMPACTS, 2013-2032 (2012\$)**

DISCOUNT RATE	PRESENT VALUE IMPACT	ANNUALIZED IMPACT
<b>BASELINE IMPACTS</b>		
7%	\$9,700,000	\$850,000
3%	\$12,000,000	\$810,000
<b>INCREMENTAL IMPACTS</b>		
7%	\$3,800,000	\$340,000
3%	\$4,700,000	\$310,000
<b>Note:</b> Estimates are rounded to two significant digits.		

<sup>2</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013. (18)



7. In addition, we consider distributional impacts associated with changes in regional oil and gas activity. While sage-grouse conservation is not expected to result in a net change in total oil and gas production or development activity at the national level, the proposed listing and critical habitat designation could result in a redistribution of oil and gas production away from areas within the proposed designation to comparable, substitute sites outside of the proposed designation. That is, substitute lease sites are not scarce enough, nor the oil and gas development opportunities within critical habitat preferable enough, to justify oil and gas operators taking on the additional burden that could result from the listing or designation of critical habitat. The impact of this distributional change is reported as a potential reduction in regional economic activity. These distributional impacts are fundamentally different measures of economic activity from the efficiency effects (net economic values) summarized above, and should not be added to those values. Exhibit ES-2 summarizes forecast regional economic impacts associated with the oil and gas industry.

**EXHIBIT ES-2. POTENTIAL REGIONAL ECONOMIC IMPACTS ASSOCIATED WITH LOSS OF OIL AND GAS PRODUCTION IN CRITICAL HABITAT**

STATE	BASELINE REGIONAL IMPACTS	INCREMENTAL REGIONAL IMPACTS
Colorado	<ul style="list-style-type: none"> <li>• Approximately \$130 million annually; and</li> <li>• Approximately 35 jobs annually.</li> </ul>	<ul style="list-style-type: none"> <li>• Approximately \$160 million annually; and</li> <li>• Approximately 44 jobs annually.</li> </ul>
Utah	<ul style="list-style-type: none"> <li>• Approximately \$200,000 annually;</li> <li>• Approximately five jobs annually; and</li> <li>• Approximately \$58,000 in tax revenue annually.</li> </ul>	<ul style="list-style-type: none"> <li>• Approximately \$210,000 annually;</li> <li>• Approximately five jobs annually; and</li> <li>• Approximately \$62,000 in tax revenue annually.</li> </ul>
<p><b>Notes:</b> These impacts are assumed to be distributive in nature and are not expected to lead to a net change in production at the national level. Thus these impacts may not be added to estimates of efficiency effects. Impacts in Colorado may also include foregone tax revenue, but these impacts are not estimated separately in the report that forms the basis of our analysis. Baseline impacts are assumed to occur in occupied habitat, and incremental impacts in unoccupied habitat.</p> <p><b>Sources:</b> Colorado Energy Research Institute, Colorado School of Mines. Oil and Gas Economic Impact Analysis. June 2007; and Bureau of Economic and Business Research, David Eccles School of Business, University of Utah. The Structure and Economic Impact of Utah's Oil and Gas Exploration and Production Industry. July 2009.</p>		

8. Exhibits ES-3 and ES-4 present baseline and incremental efficiency effects across proposed critical habitat units. Exhibits ES-5 and ES-6 show the distribution of these results across proposed units. These values do not include the regional economic impacts summarized in Exhibit ES-2, because efficiency effects and distributional effects are distinct measures of economic activity that are not additive. In the remainder of the Executive Summary, as well as the report, impacts are presented assuming a seven

percent discount rate. Appendix B presents values assuming a three percent discount rate for comparison.

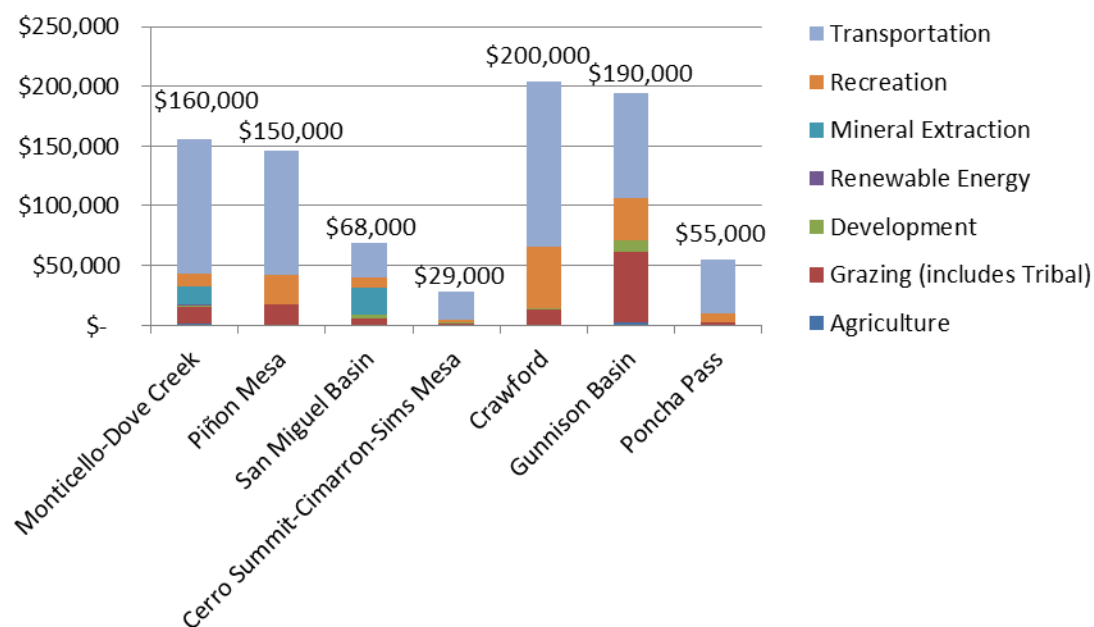
**EXHIBIT ES-3. FORECAST BASELINE IMPACTS BY UNIT, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$1,800,000	\$160,000
Piñon Mesa	\$1,700,000	\$150,000
San Miguel Basin	\$770,000	\$68,000
Cerro Summit-Cimarron-Sims Mesa	\$320,000	\$29,000
Crawford	\$2,300,000	\$200,000
Gunnison Basin	\$2,200,000	\$190,000
Poncha Pass	\$630,000	\$55,000
<b>Total</b>	<b>\$9,700,000</b>	<b>\$850,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits. Estimates do not include regional economic impacts associated with shifts in oil and gas activity because those impacts are assumed to be entirely distributive in nature.		

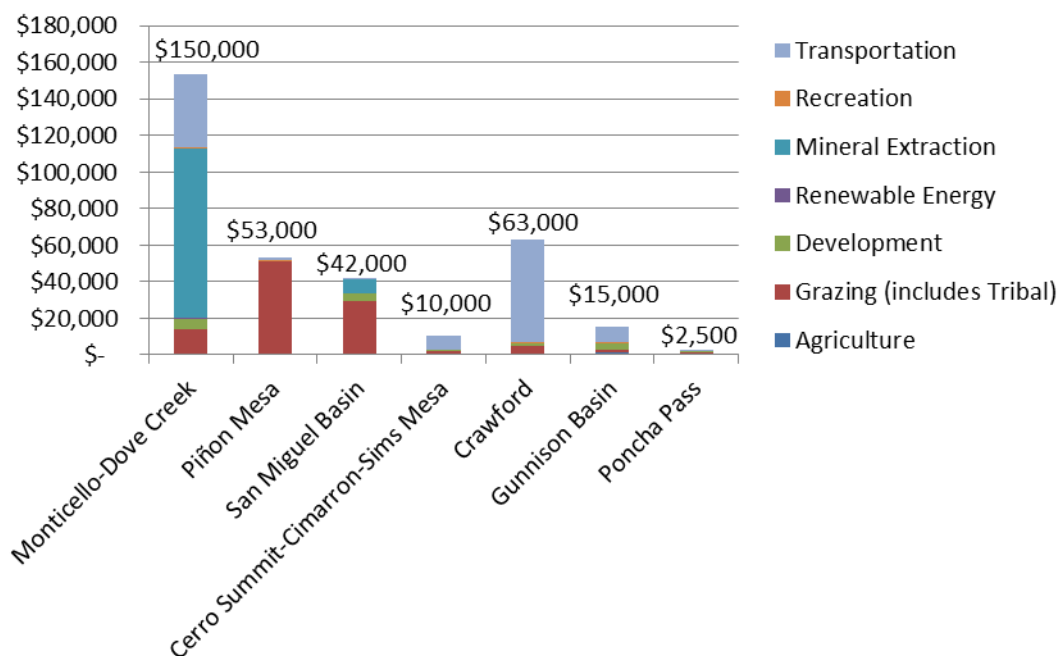
**EXHIBIT ES-4. FORECAST INCREMENTAL IMPACTS BY UNIT, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$1,700,000	\$150,000
Piñon Mesa	\$610,000	\$53,000
San Miguel Basin	\$480,000	\$42,000
Cerro Summit-Cimarron-Sims Mesa	\$120,000	\$10,000
Crawford	\$710,000	\$63,000
Gunnison Basin	\$170,000	\$15,000
Poncha Pass	\$29,000	\$2,500
<b>Total</b>	<b>\$3,800,000</b>	<b>\$340,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits. Estimates do not include regional economic impacts associated with shifts in oil and gas activity because those impacts are assumed to be entirely distributive in nature.		

**EXHIBIT ES-5. ANNUALIZED BASELINE IMPACTS BY UNIT AND ACTIVITY, 2013-2032 (2012\$, 7% DISCOUNT RATE)**



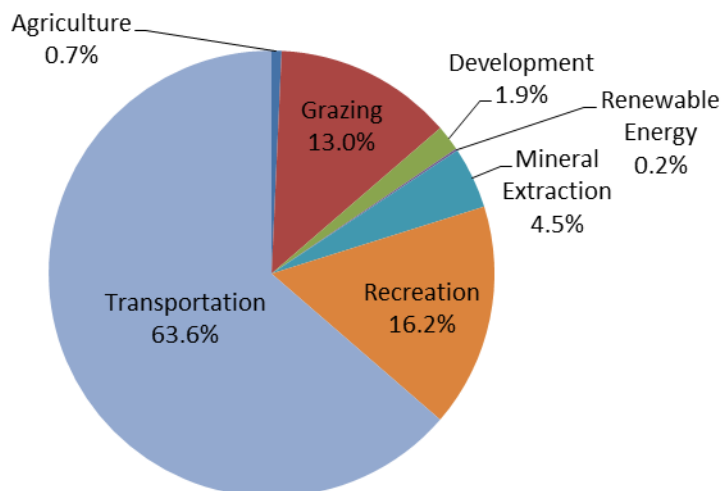
**EXHIBIT ES-6. ANNUALIZED INCREMENTAL IMPACTS BY UNIT AND ACTIVITY, 2013-2032 (2012\$, 7% DISCOUNT RATE)**



**DISCUSSION OF IMPACTS TO SPECIFIC ECONOMIC ACTIVITIES**

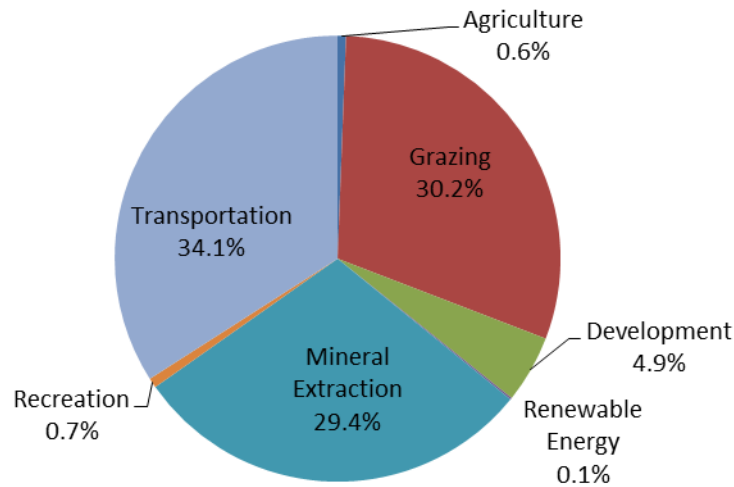
9. Exhibits ES-7 and ES-8 present baseline and incremental results by economic activity.<sup>3</sup> In the baseline, the largest category of impacts is associated with transportation projects. These costs are borne by Federal and State agencies, and include the cost of species monitoring and management as well as administrative impacts of consultation. The largest share of incremental impacts is also associated with transportation activities, followed by livestock grazing and mineral and fossil fuel extraction. Incremental transportation impacts consist solely of administrative costs, and are associated with consideration of adverse modification in programmatic consultations for Federal agencies and informal consultations for state Department of Transportation projects on non-Federal lands. Impacts associated with livestock grazing consist primarily of potential restrictions on grazing activities in unoccupied habitat. These costs will be borne by private ranchers. Impacts associated with mineral and fossil fuel extraction consist entirely of administrative impacts associated with section 7 consultations for future well pad construction in unoccupied habitat. The analysis considers potential impacts to all proposed areas including Tribal lands. In the following sections, we discuss each category of economic impacts in greater detail.

**EXHIBIT ES-7. PRESENT VALUE BASELINE IMPACTS BY ACTIVITY, 2013-2032 (2012\$, 7% DISCOUNT RATE)**



<sup>3</sup> Estimates do not include regional economic impacts associated with shifts in oil and gas activity because those impacts are assumed to be entirely distributive in nature.

**EXHIBIT ES-8. PRESENT VALUE INCREMENTAL IMPACTS BY ACTIVITY, 2013-2032 (2012\$, 7% DISCOUNT RATE)**



#### Livestock Grazing

10. The proposed designation overlaps more than 300 livestock grazing allotments on Bureau of Land Management (BLM) and U.S. Forest Service (USFS) lands. These agencies already consider sage-grouse conservation in their management of many of these allotments. This analysis considers the potential for reductions in livestock stocking rates on 107 allotments not known to be already managed for the sage-grouse. We also forecast one programmatic consultation in 2013 for each of the eight BLM or USFS field offices within the proposed designation. Baseline impacts associated with grazing restrictions and programmatic consultations are forecast to be \$1.2 million (present value over 20 years), discounted at seven percent. Incremental impacts are also forecast to be \$1.2 million (present value over 20 years), discounted at seven percent. Approximately 48 percent of incremental impacts are attributed to the Piñon Mesa unit

#### Tribal Activities

11. Approximately 12,000 acres of fee land belonging to the Ute Mountain Ute Tribe are included within the occupied portion of the Gunnison Basin unit. This land represents approximately 60 percent of Pinecrest Ranch, which supports Tribal grazing operations. Although information on specific projects that may result in section 7 consultation was not available from the Tribe, we conservatively estimate impacts associated with one formal consultation in 2013 to address operations on Pinecrest Ranch. Baseline impacts associated with the consideration of jeopardy are forecast to be \$15,000 (present value over 20 years), discounted at seven percent. Incremental impacts associated with the consideration of adverse modification are forecast to be \$5,000 (present value over 20 years), discounted at seven percent. In addition, Native American Tribes are considered sovereign nations, and often express concern that, due to Federal oversight through the Bureau of Indian Affairs, the Tribe may be compelled to modify resource use plans.

#### Agriculture and Water Management

12. Agricultural operations may have a Federal nexus for consultation through programs of Natural Resources Conservation Service (NRCS) and Farm Service Agency (FSA). These agencies anticipate conducting rangewide programmatic consultations to address sage-grouse conservation, but do not anticipate changes to conservation practices. Ongoing restoration of the Cunningham Lake Reservoir, located in the occupied portion of the Gunnison Basin unit, may also require formal consultation in 2013. Because the Reservoir is intended to support the creation and maintenance of sage-grouse habitat, we do not forecast project modifications. Baseline impacts associated with two programmatic consultations and one formal consultation in 2013 are forecast to be \$69,000 (present value over 20 years), discounted at seven percent. Incremental impacts associated with the consideration of adverse modification in these consultations are forecast to be \$23,000 (present value over 20 years), discounted at seven percent. Approximately 43 percent of incremental impacts are attributed to the Gunnison Basin unit.

#### Mineral and Fossil Fuel Extraction

13. Mineral and fossil fuel extraction occurs within the San Miguel Basin and Monticello-Dove Creek units. We forecast one formal section 7 consultation in 2013 for a planned potash exploration. We also forecast approximately eight formal consultations per year for new oil and gas well pad construction, based on information provided by BLM. Baseline impacts associated with these consultations are forecast to be \$430,000 (present value over 20 years), discounted at seven percent. Incremental impacts are forecast to be \$1.1 million (present value over 20 years), discounted at seven percent. Approximately 94 percent of incremental impacts are attributed to the Monticello-Dove Creek unit.
14. Although the Service does not intend to preclude mineral or fossil fuel extraction within the proposed designation, communication with stakeholders indicates that significant impacts may result from companies' desire to avoid regulatory burden by foregoing production in sage-grouse critical habitat in favor of alternate locations. To capture these potential effects, we consider regional economic impacts associated with the loss of oil and gas extraction activity in the proposed designation. These effects are distributional in nature (that is, not expected to result in a net change in activity at the national level) and cannot be added to other forecast economic impacts. We rely on existing studies of the contribution of the oil and gas industry to the States of Colorado and Utah to inform our analysis.<sup>4</sup> To address concerns raised in the public comments, this analysis considers a scenario in which there is total loss of oil and gas development within the proposed designation. The Service believes this is a conservative assumption – more likely to overstate than understate actual impacts – and that the more likely result of designation would be some reduction in oil and gas activity.<sup>5</sup> The results of this analysis are those summarized in Exhibit ES-2.

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<sup>4</sup> Colorado Energy Research Institute, Colorado School of Mines. Oil and Gas Economic Impact Analysis. June 2007; and Bureau of Economic and Business Research, David Eccles School of Business, University of Utah. The Structure and Economic Impact of Utah's Oil and Gas Exploration and Production Industry. July 2009.

<sup>5</sup> U.S. Fish and Wildlife Service. Personal communication on June 21, 2013.

#### Residential and Related Development

15. The proposed designation includes privately owned, potentially developable land in all units, but extensive future development is not expected due to past and projected population growth in the region. We forecast impacts associated with the purchase of land set-asides for approximately 15 formal consultations over the next 20 years, based on communication with county planners and GIS analysis. Baseline impacts are forecast to be approximately \$180,000 (present value over 20 years), discounted at seven percent. These impacts include the administrative cost of considering jeopardy to the species during consultation, as well as land set-asides for projects within occupied habitat. Incremental impacts are forecast to be approximately \$190,000 (present value over 20 years), discounted at seven percent. These impacts include the administrative cost of considering adverse modification of critical habitat during consultation, as well as land set-asides for projects within unoccupied habitat. Approximately 36 percent of incremental impacts are attributed to the Monticello-Dove Creek unit, and 28 percent to the San Miguel Basin unit.

#### Renewable Energy Development

16. Portions of the proposed designation are used for geothermal and wind energy development. All existing geothermal leases are leased to an organization that does not intend to develop the resource. Wind energy development is planned for private lands within the occupied portion of the Monticello-Dove Creek unit. We conservatively forecast one formal consultation in 2013 for the one wind project overlapping the proposed designation. Baseline impacts associated with the consideration of jeopardy are forecast to be \$15,000 (present value over 20 years), discounted at seven percent. Incremental impacts associated with the consideration of adverse modification are forecast to be \$5,000 (present value over 20 years), discounted at seven percent.

#### Recreation Activities

17. BLM, National Park Service (NPS), and USFS manage recreation activities on Federal lands within the proposed designation. These agencies expect to conduct rangewide programmatic consultations to address sage-grouse conservation following the listing and critical habitat designation. Additional monitoring and management may also be required due to the listing of the species. The agencies do not anticipate other changes to conservation practices as a result of the critical habitat designation. Baseline impacts are forecast to be \$1.6 million (present value over 20 years), discounted at seven percent. These impacts include costs associated with additional monitoring and management, and the administrative effort to consider jeopardy to the species in one programmatic consultation for each agency. Incremental impacts associated with consideration of adverse modification in these consultations are forecast to be \$27,000 (present value over 20 years), discounted at seven percent. The largest share of incremental impacts (approximately 37 percent) is associated with consultations for BLM, USFS, and NPS in the Crawford unit.



#### Transportation Activities

18. Within the proposed designation, no transportation projects are expected in Utah, and future projects in Colorado are primarily related to maintenance, reconstruction, and creation of access roads to private properties. We forecast nine programmatic consultations in 2013 for BLM, USFS, and NPS field offices to consider sage-grouse conservation in travel management, and 18 informal consultations each year for Colorado Department of Transportation (CDOT) projects. Baseline impacts, which are associated with additional monitoring and management due to the listing of the species and administrative costs of consultation, are forecast to be \$6.1 million (present value over 20 years), discounted at seven percent. Incremental impacts are limited to the administrative cost of considering adverse modification in consultation, and are forecast to be \$1.6 million (present value over 20 years), discounted at seven percent. Approximately 49 percent of incremental impacts are attributed to the Crawford unit. These impacts are associated with programmatic consultations for BLM, USFS, and NPS in 2013, plus approximately eight informal consultations annually for CDOT projects. Similar impacts (35 percent) are forecast for the Monticello-Dove Creek unit, and are associated with programmatic consultation for two BLM field offices and approximately six informal consultations annually for CDOT projects.

#### POTENTIAL BENEFITS

19. The primary purpose of this rulemaking is to enhance conservation of the sage-grouse. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance to Federal agencies on best practices for preparing economic analyses of proposed rulemakings, U.S. Office of Management and Budget (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. 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. In this report, we include a qualitative description of the categories of benefits potentially resulting from the listing and the designation and indicate the areas where such benefits may occur. We also review available literature that monetizes benefits of conservation of avian species. Because of limitations to the literature, and because information is not available to characterize the expected change in conservation probability for the sage-grouse following listing and critical habitat designation, we are not able to apply the results of these studies to this analysis.

#### IMPACTS TO SMALL ENTITIES AND THE ENERGY INDUSTRY

20. Appendix A of this report includes an analysis of the distributional impacts of the proposed designation on small entities and the energy industry to support the Service's determination regarding whether the Proposed Rule will have a significant economic impact on a substantial number of small entities, as required by the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA). Only Federal agencies are subject to a regulatory requirement (i.e., to avoid



adverse modification) as a result of the Proposed Rule, and Federal agencies are not small. However, we acknowledge that, in some cases, small entities may participate as third parties in section 7 consultations with the Service. Exhibit ES-9 presents information regarding the potential number of third parties participating in consultations on an annual basis.

21. Appendix A also concludes that, in accordance with Executive Orders 13211 and 13132, as well as Title II of the Unfunded Mandates Reform Act (UMRA), the Proposed Rule is unlikely to have any effect on energy production in the United States; is unlikely to have direct or substantial indirect federalism implications; and does not place an enforceable duty upon state, local, or Tribal governments, or the private sector.

#### **KEY SOURCES OF UNCERTAINTY**

22. In each activity-specific chapter, we include a discussion of the key sources of uncertainty and major assumptions affecting the estimation of impacts.
23. Critical habitat is primarily protected through section 7 of the Act, which 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 adversely modify critical habitat. For each activity, we discuss the potential for a Federal nexus to exist, compelling section 7 consultation with the Service. We assume a nexus is likely based on conversations with land managers and other stakeholders. For some activities, such as residential development and renewable energy development, the probability that a Federal nexus will be present for future activities is uncertain.
24. Additionally, we make assumptions about the typical conservation efforts likely to be undertaken for each activity, and their costs, based on information gathered through interviews with stakeholders. Given conversations with the Service and other stakeholders, it is unlikely that additional types of conservation efforts will be requested beyond those requested in the baseline. If additional conservation efforts are requested, this analysis will underestimate incremental impacts.

## EXHIBIT ES-9. SUMMARY OF FORECAST IMPACTS TO THIRD-PARTY PARTICIPANTS IN SECTION 7 CONSULTATION

ACTIVITY	TYPE OF IMPACT	AFFECTED ENTITIES (NAICS CODE)	SMALL ENTITIES AFFECTED IN ONE YEAR <sup>1</sup>	% OF SMALL ENTITIES	ANNUAL INCREMENTAL IMPACTS <sup>2,3</sup>	IMPACTS PER ENTITY	ANNUAL REVENUES PER SMALL ENTITY <sup>4</sup>	IMPACTS AS % OF REVENUES
Grazing	Project Modifications	Beef Cattle Ranching and Farming (112111)	63	56%	\$1.1 million	\$7,500	\$410,000	1.8%
Water Management	Administrative Impacts	Upper Gunnison River Water Conservancy District	1	1%	\$880	\$880	Unknown	Unknown
Mineral and Fossil Fuel Extraction	Administrative Impacts	Oil and Gas Extraction (211)	5-9	39% - 82%	\$17,000	\$880 - \$2,600	\$7.3 million	0.01% - 0.04%
	Administrative Impacts	RM Potash	1	100%	\$2,600	\$2,600	\$560,000	0.5%
Development	Project Modifications and Administrative Impacts	New Single-Family Housing Construction (236115); New Multifamily Housing Construction (236116); New Housing Operative Builders (236117); Land Subdivision (237210)	1-3	0.2%	\$880 - \$11,000	\$880 - \$11,000	\$4.4 million	<0.1% - 0.3%
Renewable Energy	Administrative Impacts	Eco-Power Wind Farms	1	100%	\$880	\$880	Unknown	Unknown

## Notes:

1. Detailed analysis presented in the text of Appendix A.
2. As estimated in Chapters 3 through 8.
3. This estimate excludes the additional incremental costs of consultation that would be borne by the Federal action agency and the Service.
4. For grazing, oil and gas extraction, and development, weighted average annual revenues are estimated using Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2012 to 2013*, 2012. Revenue levels are discussed in greater detail in the text of Appendix A. Listed revenue for RM Potash is from Red Metal Limited. *Annual Report*. 2012.

## CHAPTER 1 | BACKGROUND

25. This chapter provides an overview of the proposed critical habitat for the Gunnison sage-grouse (*Centrocercus minimus*). We include a brief description of the species and its habitat, a summary of the relevant regulatory history, a description of the current proposed designation, and an overview of the economic activities that may affect the proposed designation. The chapter concludes by summarizing the organization of the following chapters in this report.

### 1.1 SPECIES DESCRIPTION

26. The Gunnison sage-grouse (hereafter, “sage-grouse”) is a large bird found in southwestern Colorado and southeastern Utah. The sage-grouse is closely related to another species, the greater sage-grouse, but the two were recognized as a separate species in 2000.<sup>6</sup> Sage-grouse habitat consists primarily of expansive, interconnected sagebrush allowing for extensive seasonal movement of the birds.<sup>7</sup> Sage-grouse rely on sagebrush for both food and nesting cover.<sup>8</sup> The sage-grouse currently exists in seven separate populations.<sup>9</sup>

### 1.2 RELEVANT FEDERAL ACTIONS

27. Key milestones in the Federal regulatory history for the sage-grouse include:
- **Listing:** The sage-grouse was proposed for listing as endangered under the Endangered Species Act (Act) on January 11, 2013.<sup>10</sup>
  - **Proposed critical habitat:** In a separate rule published on the same date, the U.S. Fish and Wildlife Service (Service) proposed to designate approximately 1,704,227 acres as critical habitat for the sage-grouse.<sup>11</sup>

### 1.3 PROPOSED CRITICAL HABITAT DESIGNATION

28. Of the approximately 1.7 million acres proposed for designation, 937,765 acres are considered occupied by the species. The remaining 766,462 acres are considered unoccupied. The proposed critical habitat designation spans seven units, each of which

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<sup>6</sup> 2010 12-Month Determination, 75 FR 59805.

<sup>7</sup> 2013 Proposed Rule, 78 FR 2543.

<sup>8</sup> 2010 12-Month Determination, 75 FR 59805.

<sup>9</sup> 2013 Endangered Status Proposed Rule, 78 FR 2488.

<sup>10</sup> 2013 Endangered Status Proposed Rule, 78 FR 2486.

<sup>11</sup> 2013 Proposed Rule, 78 FR 2540.

includes both occupied and unoccupied habitat. The proposed designation is located in portions of Grand and San Juan Counties in Utah; and in Chaffee, Delta, Dolores, Gunnison, Hinsdale, Mesa, Montrose, Ouray, Saguache, and San Miguel Counties in Colorado. Exhibit 1-1 presents an overview of land ownership in the proposed units. Exhibit 1-2 presents a summary map of the proposed designation.

#### 1.4 ECONOMIC ACTIVITIES CONSIDERED IN THIS ANALYSIS

29. Review of the Proposed Rule identified the following economic activities as potential threats to the sage-grouse and its habitat within the boundaries of proposed critical habitat:
- (1) **Livestock grazing.** Some grazing management techniques may affect vegetation structure and suitability of habitat.
  - (2) **Agriculture.** Agricultural activities may result in the loss of habitat for hay meadows and cropland. In addition, the development of water features such as stock ponds and irrigation may affect habitat suitability.
  - (3) **Mineral and fossil fuel extraction.** Extraction activities - in particular, oil and gas drilling, potash and uranium mining, and construction of associated infrastructure - may result in degradation or loss of habitat.
  - (4) **Residential and related development.** Development activities may result in habitat loss and fragmentation through the construction of residential, exurban, and commercial developments and associated infrastructure such as roads, utilities, and fences.
  - (5) **Renewable energy development.** The construction and use of wind and geothermal energy infrastructure may result in degradation or loss of habitat.
  - (6) **Recreation.** Motorized and non-motorized trail recreation may increase degradation and fragmentation of habitat.
  - (7) **Transportation projects.** Construction and maintenance of roads may result in increased habitat loss and fragmentation.

#### 1.5 ORGANIZATION OF THE REPORT

30. The remainder of this report is organized into eight chapters and three appendices. Chapter 2 discusses the framework employed in the analysis, while Chapters 3 through 8 describe baseline protections currently afforded the sage-grouse and its habitat and the potential economic impacts associated with sage-grouse conservation, for each potentially affected activity. Chapter 9 describes potential economic benefits of sage-grouse conservation.

- Chapter 2 – Framework for the Analysis
- Chapter 3 – Potential Economic Impacts to Livestock Grazing Activities
- Chapter 4 – Potential Economic Impacts to Agriculture and Water Management
- Chapter 5 – Potential Economic Impacts to Mineral and Fossil Fuel Extraction
- Chapter 6 – Potential Economic Impacts to Residential and Related Development

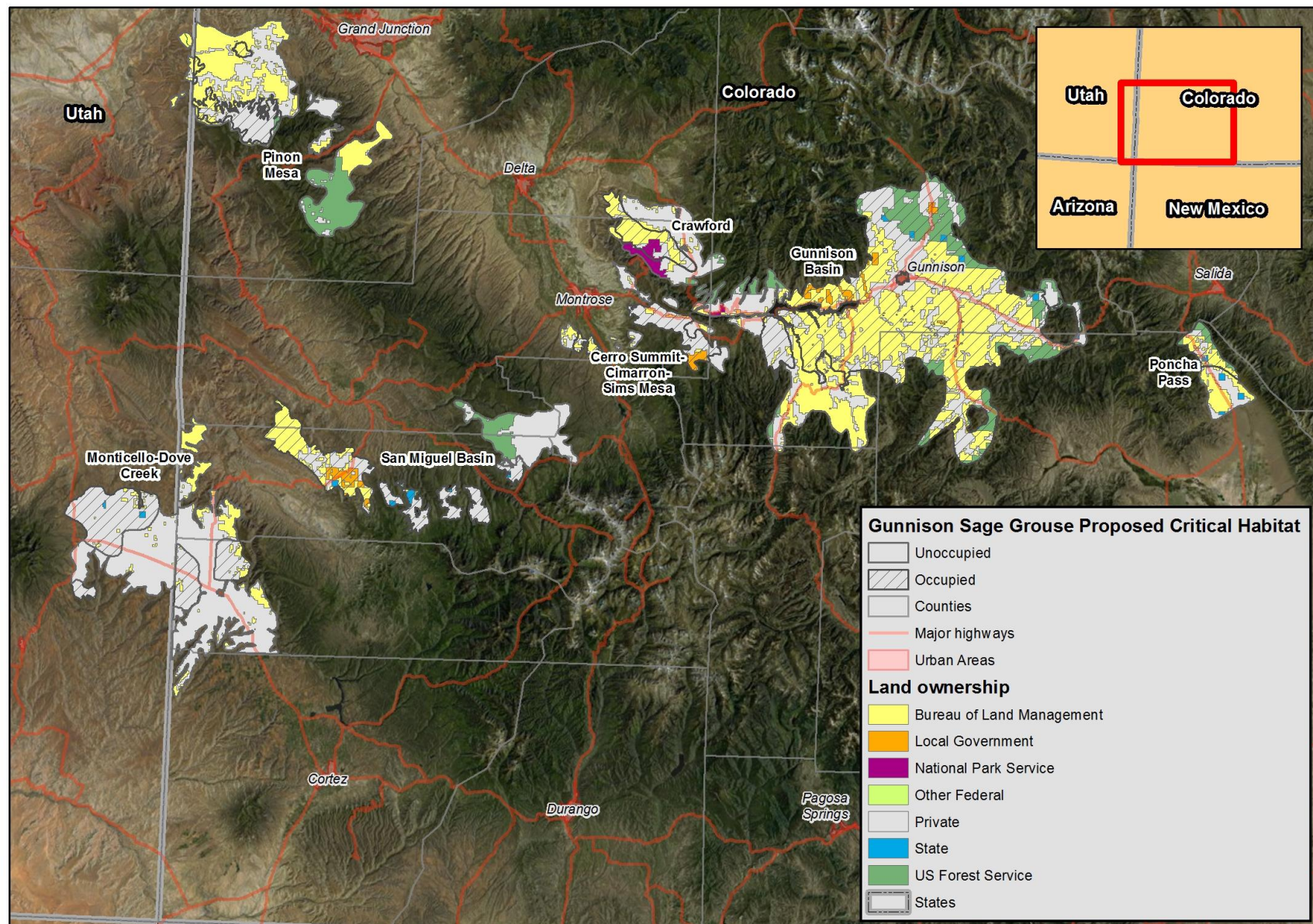
- Chapter 7 – Potential Economic Impacts to Renewable Energy Development
- Chapter 8 – Potential Economic Impacts to Recreation and Transportation Activities
- Chapter 9 – Economic Benefits
- Appendix A – Additional Statutory Requirements
- Appendix B – Sensitivity of Results to Discount Rate
- Appendix C – Incremental Effects Memorandum

## EXHIBIT 1-1. LAND OWNERSHIP IN PROPOSED CRITICAL HABITAT

UNIT NUMBER	UNIT NAME	ACRES IN UNIT (PERCENT OF TOTAL)	FEDERAL ACRES	STATE ACRES	PRIVATE ACRES	LOCATION	OCCUPIED?	ACRES BY OCCUPANCY
1	Monticello-Dove Creek	348,353 (20.4%)	44,043	3,290	301,019	San Juan County, Utah; Montrose, San Miguel, and Dolores Counties, Colorado	Yes	111,945
							No	236,408
2	Piñon Mesa	245,179 (14.4%)	153,548	73	91,558	Grand County, Utah; Mesa County, Colorado	Yes	38,905
							No	206,274
3	San Miguel Basin	165,769 (9.7%)	55,837	14,598	95,334	Montrose, San Miguel, and Ouray Counties, Colorado	Yes	101,371
							No	64,398
4	Cerro Summit- Cimarron-Sims Mesa	62,708 (3.7%)	10,307	4,066	48,335	Montrose, Ouray, and Gunnison Counties, Colorado	Yes	37,161
							No	25,547
5	Crawford	97,123 (5.7%)	44,091	277*	53,032	Delta, Montrose, and Gunnison Counties, Colorado	Yes	35,015
							No	62,108
6	Gunnison Basin	736,802 (43.2%)	486,652	14,955*	235,197**	Gunnison, Hinsdale, Montrose, and Saguache Counties, Colorado	Yes	592,952
							No	143,850
7	Poncha Pass	48,292 (2.8%)	30,287	2,084	15,921	Saguache and Chaffee Counties, Colorado	Yes	20,416
							No	27,877
Total		1,704,227 (100%)	824,765	39,066	840,396		Yes	937,765
							No	766,462
Notes:								
*Includes land jointly owned by the Federal government and the State of Colorado.								
**Includes land owned by Gunnison County and the City of Gunnison.								
Sources:								
U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013. (18)								
2013 Proposed Rule, 78 FR 2550-2551.								



## EXHIBIT 1-2. OVERVIEW OF PROPOSED CRITICAL HABITAT



## Sources:

1. U.S. Fish and Wildlife Service
2. Environmental Systems Research Institute, Inc. (ESRI)
3. Bureau of Land Management

0 10 20 40 Miles



## CHAPTER 2 | FRAMEWORK FOR THE ANALYSIS

31. The purpose of this report is to estimate the economic impact of actions taken to protect the sage-grouse and its habitat. This analysis examines the impacts of restricting or modifying specific land uses or other activities for the benefit of the species and its habitat within the proposed critical habitat designation. This analysis employs "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections otherwise accorded the sage-grouse—for example, under the Federal listing and other Federal, State, and local laws and conservation plans. The "with critical habitat" scenario describes the incremental impacts associated with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat for the sage-grouse. Summed, these two types of impacts comprise the fully co-extensive impacts of conservation in areas proposed for critical habitat designation.
32. This information is intended to assist the Secretary of the U.S. Department of the Interior (DOI) in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.<sup>12</sup> In addition, this information allows the Service to address the requirements of Executive Orders 12866 (as amended by Executive Order 13563), 12630, and 13211; the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA); and the Unfunded Mandates Reform Act (UMRA).<sup>13</sup>
33. This chapter describes the framework for this analysis. First, we describe case law that led to the selection of the framework applied in this report. Next, we describe in economic terms the general categories of economic effects that are the focus of the impact analysis, including a discussion of both efficiency and distributional effects. This chapter then defines the analytic framework used to measure these impacts in the context of critical habitat regulation. We conclude with a discussion of the consideration of economic benefits, information sources relied upon in the analysis, and presentation of results.

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<sup>12</sup> 16 U.S.C. § 1533(b)(2).

<sup>13</sup> Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993; Executive Order 13563, *Improving Regulation and Regulatory Review*, January 18, 2011; Executive Order 12630, *Governmental Actions and Interference with Constitutionally Protected Property Rights*, March 15, 1988; Executive Order 13211, *Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use*, May 18, 2001; 5 U.S.C. §§ 601 et seq; Pub Law No. 104-121; and 2 U.S.C. §§ 1501 et seq.



## 2.1 BACKGROUND

34. The U.S. Office of Management and Budget (OMB) produces guidelines for conducting economic analysis of regulations, directing Federal agencies to measure the costs of a regulatory action against a baseline (i.e., costs that are “incremental” to the baseline). OMB defines the baseline as the “best assessment of the way the world would look absent the proposed action.”<sup>14</sup> 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 designation.

35. In 2001, the U.S. Tenth Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, regardless of whether those impacts are attributable co-extensively to other causes.<sup>15</sup> Specifically, the court stated,

“The statutory language is plain in requiring some kind of consideration of economic impact in the CHD [critical habitat designation] phase. Although 50 C.F.R. 402.02 is not at issue here, the regulation’s definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless. We are compelled by the canons of statutory interpretation to give some effect to the congressional directive that economic impacts be considered at the time of critical habitat designation. . . . Because economic analysis done using the FWS’s [Fish and Wildlife Service’s] baseline model is rendered essentially without meaning by 50 C.F.R. § 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes. Thus, we hold the baseline approach to economic analysis is not in accord with the language or intent of the ESA [Endangered Species Act].”<sup>16</sup>

36. 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.<sup>17</sup> For example,

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<sup>14</sup> U.S. Office of Management and Budget, “Circular A-4,” September 17, 2003, accessed at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

<sup>15</sup> *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

<sup>16</sup> *Ibid.*

<sup>17</sup> In explanation of their differing conclusion, later decisions note that in *New Mexico Cattle Growers*, the U.S. Tenth Circuit Court of Appeals relied on a Service regulation that defined “destruction and adverse modification” in the context of section 7 consultation as effectively identical to the standard for “jeopardy.” Courts had since found that this definition of “adverse modification” was too narrow. For more details, see the discussion of *Gifford Pinchot Task Force v. United States Fish and Wildlife Service* provided later in this section.

in the March 2006 ruling that the August 2004 critical habitat rule for the Peirson's milk-vetch was arbitrary and capricious, the United States District Court for the Northern District of California stated,

“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.’”<sup>18</sup>

37. More recently, in 2010, the U.S. Ninth Circuit Court of Appeals came to similar conclusions during its review of critical habitat designations for the Mexican spotted owl and 15 vernal pool species.<sup>19</sup> Plaintiffs in both cases requested review by the Supreme Court, which declined to hear the cases in 2011.
38. Because the proposed critical habitat for the sage-grouse falls within the Tenth Circuit, and in order to provide the most complete information to decision-makers, this economic analysis reports both:
  - The baseline impacts of protections afforded the sage-grouse absent critical habitat designation; and
  - The estimated incremental impacts precipitated specifically by the designation of critical habitat for the species.

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

39. Several Courts of Appeal, including the Ninth Circuit and the Fifth Circuit, have invalidated the Service’s regulation defining destruction or adverse modification of critical habitat.<sup>20</sup> At this time the Service is analyzing whether destruction or adverse modification would occur based on the statutory language of the Act itself, which requires the Service to consider whether the agency’s action is likely “to result in the destruction or adverse modification of habitat which is determined by the Service to be critical” to the conservation of the species. To perform this analysis, the Service considers

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<sup>18</sup> *Center for Biological Diversity et al., Plaintiffs, v. United States Bureau of Land Management et al., Defendants and American Sand Association, et al., Defendant Intervenors*. Order re: Cross Motions for Summary Judgment, Case 3:03-cv-02509 Document 174 Filed 03/14/2006. (44-45)

<sup>19</sup> *Home Builders Association of Northern California v. United States Fish and Wildlife Service*, 616 F.3d 983 (9<sup>th</sup> Cir. 2010), cert. denied, 179 L. Ed 2d 301, 2011 U.S. Lexis 1392, 79 U.S.L.W. 3475 (2011); *Arizona Cattle Growers v. Salazar*, 606 F. 3d 1160 (9<sup>th</sup> Cir. 2010), cert. denied, 179 L. Ed. 2d 300, 2011 U.S. LEXIS 1362, 79 U.S.L.W. 3475 (2011).

<sup>20</sup> *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, 378 F.3d 1059 (9<sup>th</sup> Cir. 2004); *Sierra Club v. U. S. Fish and Wildlife Service*, 245 F.3d 434 (5<sup>th</sup> Cir. 2001).

how the proposed action is likely to impact the function of the critical habitat unit in question. To assist us in evaluating these likely impacts, the Service provided information regarding what potential consultations could occur in the critical habitat units for the sage-grouse and what project modifications may be imposed as a result of critical habitat designation. The Service also provided a memorandum characterizing the effects of critical habitat designation over and above those associated with the listing (see Appendix C). A detailed description of the methodology used to define baseline and incremental impacts is provided later in this section.

## **2.2 CATEGORIES OF POTENTIAL ECONOMIC EFFECTS OF SPECIES CONSERVATION**

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

41. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of sage-grouse conservation and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether the effects of species conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts.

### **2.2.1 EFFICIENCY EFFECTS**

42. At the guidance of OMB and in compliance with Executive Order 12866 "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect the sage-grouse and its 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.<sup>21</sup>

43. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager may enter into a section 7 consultation with the Service to ensure that a

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<sup>21</sup> 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, accessed at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.

particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets -- that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price -- the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.

44. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, protection measures that reduce or preclude the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market. These types of market impacts are generally not anticipated to result from sage-grouse conservation efforts. This analysis therefore focuses on compliance costs.

#### 2.2.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

45. 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.<sup>22</sup> This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

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

46. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the RFA, might be affected by future species conservation efforts.<sup>23</sup> It also assesses the potential for impacts to state, local and Tribal governments and the private sector as required by Title II of UMRA.<sup>24</sup> 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.<sup>25</sup>

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<sup>22</sup> U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, accessed at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

<sup>23</sup> 5 U.S.C. §§ 601 et seq.

<sup>24</sup> 2 U.S.C. §§ 1531 et seq.

<sup>25</sup> Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

#### Regional Economic Effects

47. 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 mining companies) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to mining companies). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.
48. 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. These models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by affected businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.
49. 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 (that is, regional impacts may occur even if there is no net change in economic activity at the national level). Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.

### 2.3 ANALYTIC FRAMEWORK AND SCOPE OF THE ANALYSIS

50. This analysis: 1) identifies those economic activities most likely to threaten the sage-grouse and its habitat; 2) describes the baseline regulatory protection for the species; and 3) monetizes the baseline and incremental (together, coextensive) economic impacts associated with sage-grouse conservation within the proposed designation. This section describes our approach to identifying and distinguishing baseline and incremental impacts. The section concludes by addressing the consideration of benefits and the geographic scope and time frame for the analysis.

#### 2.3.1 IDENTIFYING BASELINE IMPACTS

51. The baseline for this analysis is the existing state of regulation, prior to the designation of critical habitat, which provides protection to the species under Act, as well as under other

Federal, state and local laws and guidelines.<sup>26</sup> This "without critical habitat designation" scenario also considers a wide range of additional factors beyond the compliance costs of regulations that provide protection to the listed species. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by the Service and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.

52. Baseline protections include sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections to the extent that they are expected to occur absent the designation of critical habitat for the species. This analysis describes and monetizes these baseline protections.

- Section 7 of Act, absent critical habitat designation, requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. Consultations under the jeopardy standard result in administrative costs, as well as impacts associated with conservation efforts resulting from consideration of this standard.
- Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."<sup>27</sup> The economic impacts associated with this section manifest themselves in sections 7 and 10.
- Under section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop a habitat conservation plan (HCP) for a listed animal species in order to meet the conditions for issuance of an incidental take permit in connection with a land or water use activity or project.<sup>28</sup> The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are minimized and mitigated to the maximum extent practicable. The development and implementation of HCPs is considered a baseline protection for the species and habitat unless the HCP is determined to be precipitated by the designation of critical habitat, or the designation influences stipulated conservation efforts under HCPs.

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

53. 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

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<sup>26</sup> For purposes of this analysis, we assume that the sage-grouse is listed under the Act. As a result, we assume that protections due to the listing of species occur in the baseline.

<sup>27</sup> 16 U.S.C. § 1532.

<sup>28</sup> U.S. Fish and Wildlife Service. 2002. "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at <http://endangered.fws.gov/hcp/>.



resources under their jurisdiction. If compliance with the Clean Water Act (CWA) or state environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are categorized accordingly. Of note, however, is that such efforts may not be considered baseline in the case that they would not have been triggered absent the designation of critical habitat. In these cases, they are considered incremental impacts and are discussed below.

### 2.3.2 IDENTIFYING INCREMENTAL IMPACTS

54. This analysis also monetizes the potential incremental impacts of the Proposed Rule. The focus of the incremental analysis is to determine the impacts on land uses and activities from the designation of critical habitat that are above and beyond those impacts resulting from required efforts as a result of a species listing or voluntary conservation efforts undertaken by other Federal, state, and local regulations or guidelines.
55. 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 conservation efforts (i.e., reasonable and prudent alternatives) resulting from the protection of critical habitat are the compliance costs of designating critical habitat. These costs are not in the baseline and are considered incremental impacts of the rulemaking.
56. Incremental impacts may be the compliance costs associated with additional effort for consultations, reinitiated consultations, new consultations occurring specifically because of the designation, and additional conservation efforts that would not have been requested under the jeopardy standard. Additionally, incremental impacts may include other, non-section 7 impacts resulting from designation of critical habitat, such as triggering of additional requirements under state or local laws intended to protect sensitive habitat, and uncertainty and perceptual effects on markets.

#### Section 7 Impacts

57. The section 7-related 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 incremental, section 7-related impacts of critical habitat designation are: 1) the administrative costs of conducting section 7 consultation; and 2) implementation of any conservation efforts requested by the Service through section 7 consultation to avoid potential destruction or adverse modification of critical habitat.<sup>29</sup>
58. 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

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<sup>29</sup> The term conservation efforts is intended to broadly capture efforts that stakeholders may undertake for the species, regardless of whether these efforts are explicitly called for in a section 7 consultation.

designated critical habitat. Parties involved in section 7 consultations include the Service, a Federal “action agency,” such as the U.S. Army Corps of Engineers (Corps), and in some cases, a private entity involved in the project or land use activity (“applicant”), such as the recipient of a CWA section 404 permit. If there is an applicant, the action agency (i.e., the agency with the Federal nexus necessitating the consultation) consults with the Service and also serves as the liaison between the applicant and the Service.

59. During consultation, the Service, the action agency, and the entity applying for Federal funding or permitting (if applicable) communicate in an effort to minimize potential adverse effects to the species and/or to the proposed critical habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these interactions. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, and the potential effects to the species and designated critical habitat associated with the proposed activity, the Federal agency, and whether there is a private applicant involved.
60. Section 7 consultations with the Service may be either informal or formal. *Informal consultations* consist of discussions between the Service, the action agency, and the applicant concerning an action that may affect a listed species or its designated critical habitat, and are designed to identify and resolve potential concerns at an early stage in the planning process. By contrast, a *formal consultation* is required if the action agency determines that its proposed action may or will adversely affect the listed species or designated critical habitat in ways that cannot be resolved through informal consultation. The formal consultation process results in the Service’s determination in its Biological Opinion of whether the action is likely to jeopardize a species or destroy or adversely modify critical habitat. Regardless of the type of consultation or proposed project, section 7 consultations can require administrative effort on the part of all participants.

#### Administrative Section 7 Consultation Costs

61. In habitat occupied by the species, consultations are required for activities that involve a Federal nexus and may affect the species regardless of whether critical habitat is designated. However, the designation may increase the effort for these consultations if the project or activity in question may affect critical habitat. The designation may also result in an increase in the number of consultations in unoccupied habitat. Activities located in unoccupied habitat would, in most cases, not have been required to consult under the jeopardy standard. Administrative efforts for consultation may therefore result in both baseline and incremental impacts.
62. 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 (but for which the project or activity is not yet completed) 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. Re-initiations of consultation for the sage-grouse are not anticipated due to the concurrent listing and critical habitat designation rulemakings.

**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). 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 these consultations are considered incremental impacts of the designation.

63. The administrative costs of these consultations vary depending on the specifics of the project. One way to address this variability is to show a range of possible costs of consultation, as it may not be possible to predict the precise level of effort of each future consultation. Review of consultation records and discussions with multiple Service field offices resulted in a range of estimated administrative costs of consultation. For simplicity, the average of the range of costs in each category is applied in this analysis (see Exhibit 2-1).

EXHIBIT 2-1. RANGE OF ADMINISTRATIVE CONSULTATIONS COSTS (2012\$)

CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
BASELINE ADMINISTRATIVE COSTS OF CONSULTATION					
CONSULTATION CONSIDERING JEOPARDY (DOES NOT INCLUDE CONSIDERATION OF ADVERSE MODIFICATION)					
Technical Assistance	\$430	n/a	\$790	n/a	\$1,200
Informal	\$1,800	\$2,300	\$1,500	\$1,500	\$7,100
Formal	\$4,100	\$4,700	\$2,600	\$3,600	\$15,000
Programmatic	\$12,000	\$10,000	n/a	\$4,200	\$27,000
INCREMENTAL ADMINISTRATIVE COSTS OF CONSULTATION					
NEW CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION (TOTAL COST OF A CONSULTATION CONSIDERING BOTH JEOPARDY AND ADVERSE MODIFICATION)					
Technical Assistance	\$570	n/a	\$1,100	n/a	\$1,600
Informal	\$2,500	\$3,100	\$2,100	\$2,000	\$9,500
Formal	\$5,500	\$6,200	\$3,500	\$4,800	\$20,000
Programmatic	\$17,000	\$14,000	n/a	\$5,600	\$36,000
NEW CONSULTATION CONSIDERING ONLY ADVERSE MODIFICATION (UNOCCUPIED HABITAT)					
Technical Assistance	\$430	n/a	\$790	n/a	\$1,200
Informal	\$1,800	\$2,300	\$1,500	\$1,500	\$7,100
Formal	\$4,100	\$4,700	\$2,600	\$3,600	\$15,000
Programmatic	\$12,000	\$10,000	n/a	\$4,200	\$27,000
RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION					
Technical Assistance	\$290	n/a	\$530	n/a	\$810
Informal	\$1,200	\$1,600	\$1,000	\$1,000	\$4,800
Formal	\$2,800	\$3,100	\$1,800	\$2,400	\$10,000
Programmatic	\$8,300	\$6,900	n/a	\$2,800	\$18,000
ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION (ADDITIVE WITH BASELINE COSTS ABOVE OF CONSIDERING JEOPARDY)					
Technical Assistance	\$140	n/a	\$260	n/a	\$410
Informal	\$610	\$780	\$510	\$500	\$2,400
Formal	\$1,400	\$1,600	\$880	\$1,200	\$5,000
Programmatic	\$4,200	\$3,500	n/a	\$1,400	\$9,000
Source: IEc analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2013, and a review of consultation records from several Service field offices across the country conducted in 2002.					
Notes:					
1. Estimates are rounded to two significant digits and may not sum due to rounding.					
2. Estimates reflect average hourly time required by staff.					

### Section 7 Conservation Effort Costs

64. Section 7 consultations considering critical habitat may also result in additional conservation effort recommendations specifically addressing potential destruction or adverse modification of critical habitat. For future consultations considering jeopardy and adverse modification, and for re-initiations of past consultations to consider critical habitat, the economic impacts of conservation efforts undertaken to avoid adverse modification are considered incremental impacts of critical habitat designation. For consultations that are forecast to occur specifically because of the designation, impacts of all associated conservation efforts are assumed to be incremental impacts of the designation. This is summarized below.
1. **Additional effort to address adverse modification in a new consultation -**  
Only project modifications above and beyond what would be requested to avoid or minimize jeopardy are considered incremental.
  2. **Re-initiation of consultation to address adverse modification -** Only project modifications above and beyond what was requested to avoid or minimize jeopardy are considered incremental. As noted above, due to the concurrent listing and critical habitat designation rulemakings for the sage-grouse, re-initiations of consultation are not expected.
  3. **Incremental consultation resulting entirely from critical habitat designation-**  
Impacts of all project modifications are considered incremental.

### Other Impacts

65. 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. These other (i.e., non-section 7) impacts are those unintended changes in economic behavior that may occur outside of the Act, through other Federal, state, or local actions, and that are caused by the species listing or designation of critical habitat. This section identifies common types of non-section 7 impacts that may be associated with the designation of critical habitat. Importantly, these types of impacts are not always considered incremental. In the case that these types of conservation efforts and economic effects are expected to occur regardless of critical habitat designation, they are appropriately considered baseline impacts.
66. These types of other impacts may include:
- **Habitat Conservation Plans and other Land and Resource Management Plans.** Under section 10 of the Act, landowners seeking an incidental take permit must develop an HCP to counterbalance the potential harmful effects that an otherwise lawful activity may have on a species. As such, the purpose of the habitat conservation planning process is to ensure that the effects of incidental take are adequately avoided or minimized. Application for an incidental take permit and completion of an HCP are not required or necessarily recommended by a critical habitat designation. However, in certain situations the new information provided by the proposed critical habitat rule may prompt a landowner to apply for an

incidental take permit or otherwise develop a land and resource management plan. For example, a landowner may have been previously unaware of the potential presence of the species on his or her property, and expeditious completion of an HCP or management plan may offer the landowner regulatory relief in the form of exclusion from the final critical habitat designation. In this case, the effort involved in creating the plan and undertaking associated conservation efforts is considered an incremental effect of designation

- **Triggering Other State and Local Laws.** Under certain circumstances, species listing or 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.
- **Time Delays.** Both public and private entities may experience 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 listing or critical habitat designation.
- **Regulatory Uncertainty or Stigma.** 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 alternatives will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of the listing or critical habitat designation 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 non-section 7 impacts of the designation. In some cases, the public may perceive that the regulation will result in limitations on private property uses above and beyond those conservation efforts actually recommended by the Service. Public attitudes about potential limits or restrictions can cause real economic effects to property owners, regardless of whether such limits are imposed. As the public becomes aware of the true regulatory burden imposed by listing or critical habitat designation, the impact of the regulations on property markets may decrease. Data allowing for the quantification of such effects are generally unavailable.

The potential for these types of impacts is addressed in more detail in the following activity-specific chapters. We discuss the potential for impacts associated with development of the Gunnison Basin Candidate Conservation Agreement (CCA) that is currently being developed for management of activities of Federal lands. We also discuss the potential for impacts associated with regulatory uncertainty and stigma, particularly in the context of agricultural activities on privately owned lands and the extraction of mineral and fossil fuel resources. Finally, we discuss potential time delays that may affect mineral and fossil fuel extraction operations. At this time, we do not expect any future impacts associated with the triggering of state and local laws.

#### Approach to Identifying Incremental Impacts

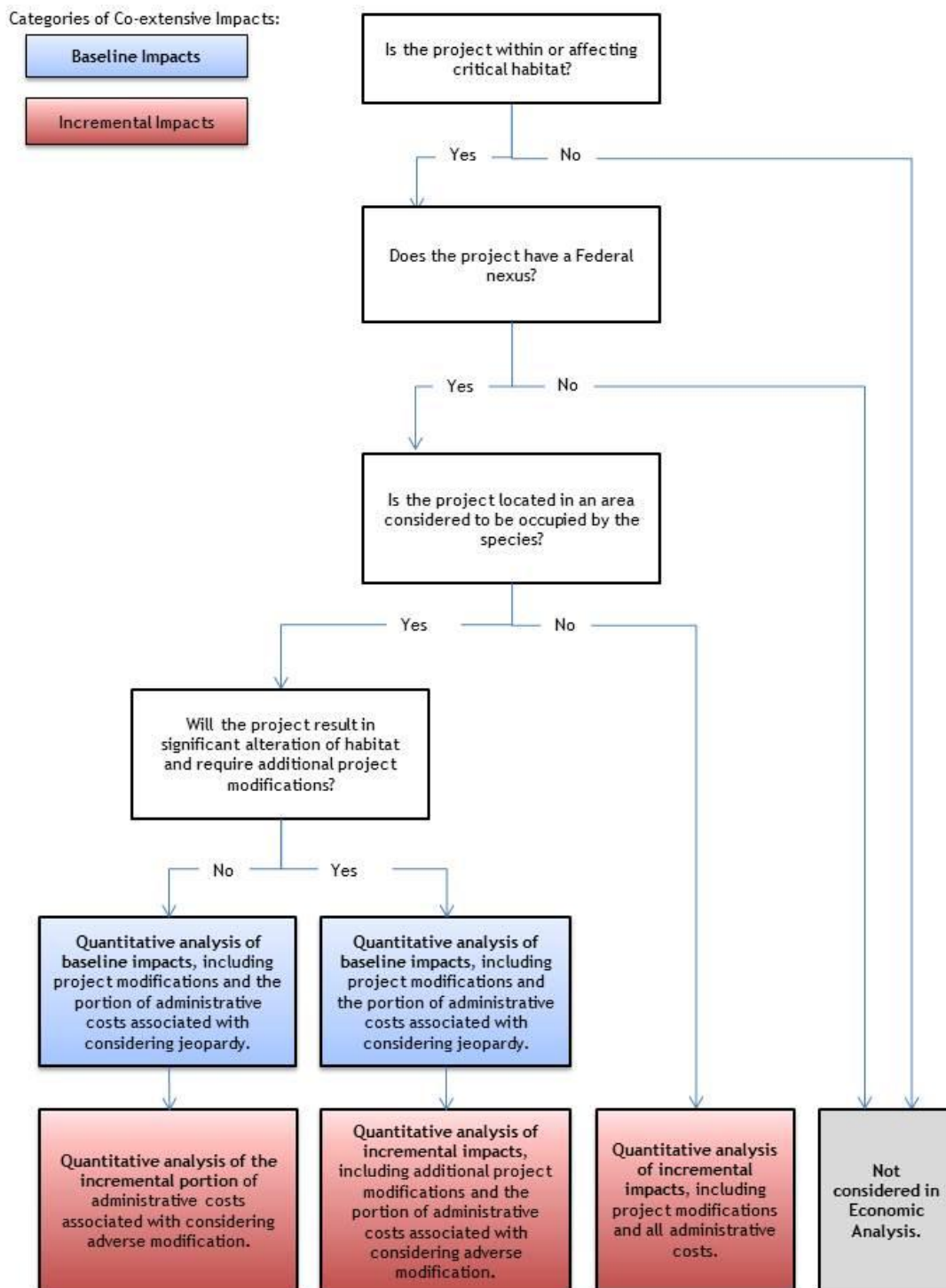
67. To inform the economic analysis, the Service provided a memorandum describing its expected approach to conservation for the sage-grouse following critical habitat designation. We rely on this memorandum to provide information on how the Service intends to address projects that might lead to adverse modification of critical habitat as distinct from projects that may jeopardize the species. The Service's memorandum is provided in Appendix C.
68. The nature and extent of potential impacts of critical habitat on a particular area or planned activity will depend on several variables, including:
- **Whether a Federal nexus is present for activities expected to occur within the proposed designation.** If there is a Federal nexus associated with a planned activity in proposed critical habitat, then we assume that a section 7 consultation will occur, unless an action agency informs us that consultation is unlikely. If there is not a Federal nexus associated with a planned activity in proposed critical habitat, we assume that a future consultation on that activity will not occur. The analysis considers whether non-section 7 impacts to activities without a Federal nexus may occur as a result of the critical habitat designation.
  - **Whether the affected area is considered unoccupied by the species.** All units include habitat considered to be occupied by the species as well as habitat considered to be unoccupied by the species. Our analysis assumes that future section 7 consultations on sage-grouse in unoccupied critical habitat would not have occurred absent critical habitat designation. Thus, any future consultations on the sage-grouse in unoccupied proposed critical habitat, as well as any associated project modifications, are considered incremental impacts of the Proposed Rule.
  - **Whether the activity is expected to disturb a large portion of proposed critical habitat.** As described in the Service's memorandum, the Service does not, in most cases, anticipate any differences in the types of project modifications requested to avoid jeopardy and those to avoid adverse modification of critical habitat. However, the Service notes that projects involving "significant alteration of habitat" may result in additional project modifications.<sup>30</sup> For any projects likely to result in significant permanent alteration of proposed critical habitat, we will consider whether additional project modifications are likely to be requested. Costs associated with these project modifications will be considered incremental impacts of the Proposed Rule.

Exhibit 2-2 summarizes this decision framework.

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<sup>30</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013. (18)

## EXHIBIT 2-2. FRAMEWORK FOR DETERMINING BASELINE AND INCREMENTAL IMPACTS



69. However, across the proposed designation, we acknowledge the Service's statement that additional project modifications such as habitat avoidance and project redesign may be requested in situations where "significant alteration of habitat is proposed."<sup>31</sup> We expect that additional project modifications, beyond those required by the listing of the species, will be requested only for projects anticipated to result in permanent degradation of critical habitat over a large geographic area. The following chapters address the likelihood of additional project modifications by economic activity.
70. Possible sources of a Federal nexus include the location of activities on federally managed lands; Federal funding (e.g., Federal Highway Administration funding for transportation projects, or agricultural operations participating in programs of the Natural Resources Conservation Service (NRCS) or Farm Service Agency (FSA)); and Federal permits (e.g., issuance of CWA section 404 permits by the Corps). The economic analysis considers activities on Federal lands and activities on non-Federal lands that have a Federal nexus through funding or permitting.
71. For projects that are located in habitat considered to be occupied by the species, we assume the types of conservation efforts requested by the Service to avoid adverse modification of critical habitat will not differ from those requested to avoid jeopardy to the species. This assumption is based on the Service's statement that "section 7 consultation analyses will result in no differences between recommendations to avoid jeopardy or adverse modification in areas of critical habitat, except in unoccupied portions of critical habitat."<sup>32</sup> As a result, all co-extensive project modifications in occupied habitat are attributed to the baseline scenario, and all co-extensive project modifications in unoccupied habitat are attributed to the incremental scenario.

### 2.3.3 BENEFITS

72. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.<sup>33</sup> 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.<sup>34</sup>
73. The primary intended benefit of critical habitat (i.e., the direct benefit) is to support the conservation of threatened and endangered species, such as the sage-grouse. Thus, attempts to develop monetary estimates of the primary benefits of this proposed critical habitat designation would focus on the public's willingness to pay to achieve the conservation benefits to the sage-grouse resulting from this designation. In its guidance

<sup>31</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013. (18)

<sup>32</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013. (18)

<sup>33</sup> Executive Order 12866, Regulatory Planning and Review, September 30, 1993.

<sup>34</sup> U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, accessed at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.



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.<sup>35</sup> 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.

74. However, the published economics literature has documented that social welfare benefits can result from the conservation and recovery of similar species. Chapter 10 of this analysis considers the applicability of this literature to the sage-grouse.
75. 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 or improved water quality. 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 negative impacts to a region's economy resulting from actions to conserve a species or its habitat.

#### 2.3.4 GEOGRAPHIC SCOPE OF THE ANALYSIS

76. Economic impacts of sage-grouse conservation are considered across the entire area proposed for critical habitat designation, as defined in Chapter 1. Results are presented by proposed critical habitat unit.

#### 2.3.5 ANALYTIC TIME FRAME

77. Ideally, the time frame of this analysis would be based on the expected time period over which the critical habitat regulation is expected to be in place. Specifically, the analysis would forecast impacts of implementing this rule through species recovery (i.e., when the rule is no longer required). Recent guidance from OMB indicates that "if a regulation has no predetermined sunset provision, the agency will need to choose the endpoint of its analysis on the basis of a judgment about the foreseeable future."<sup>36</sup> The "foreseeable future" for this analysis includes, but is not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. Forecast impacts will be based on the planning periods for potentially affected projects and will look out over a 20-year time horizon (2013 through 2032). OMB supports this time frame stating that "for most agencies, a standard time period of analysis is ten to 20 years, and rarely exceeds 50 years."<sup>37</sup>

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<sup>35</sup> *Ibid.*

<sup>36</sup> U.S. Office of Management and Budget. 2011. "Regulatory Impact Analysis: Frequently Asked Questions (FAQs)," February 7, 2011. Accessed at [http://www.whitehouse.gov/sites/default/files/omb/circulars/a004/a-4\\_FAQ.pdf](http://www.whitehouse.gov/sites/default/files/omb/circulars/a004/a-4_FAQ.pdf) on May 3, 2011.

<sup>37</sup> *Ibid.*



**2.4 INFORMATION SOURCES**

78. The primary sources of information for this report are communications with, and data provided by, personnel from the Service, local governments and other stakeholders. In particular, this analysis relies upon the Incremental Effects Memorandum provided by the Service (see Appendix C). In addition, this analysis relies upon existing habitat management and conservation plans that consider the sage-grouse. A complete list of references is provided at the end of this document.

**2.5 PRESENTATION OF RESULTS**

79. Throughout the body of the report, impacts are described by proposed critical habitat unit in present value and annualized terms applying a discount rate of seven percent. Additionally, Appendix B provides present and annualized values applying a three percent discount rate for comparison.<sup>38</sup> Appendix B also presents undiscounted annual impact values by activity and unit. Present value and annualized impacts are calculated according to the methods described in Exhibit 2-3.

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<sup>38</sup> The U.S. Office of Management and Budget (OMB) requires Federal agencies to report results using discount rates of three and seven percent (see: U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, accessed at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>).

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**EXHIBIT 2-3. CALCULATING PRESENT VALUE AND ANNUALIZED IMPACTS**

This analysis compares economic impacts incurred in different time periods in present value terms. The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in today's dollars. Translation of economic impacts of past or future costs to present value terms requires the following: a) past or projected future costs of critical habitat designation; and b) the specific years in which these impacts have been or are expected to be incurred. With these data, the present value of the past or future stream of impacts ( $PV_c$ ) from year  $t$  to  $T$  is measured in 2012 dollars according to the following standard formula:

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

$C_t$  = cost of sage-grouse conservation efforts in year  $t$

$r$  = discount rate<sup>a</sup>

Impacts for each activity in each unit are also expressed as annualized values. Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods ( $T$ ). For this analysis, activities employ a forecast period of 20 years. Annualized future impacts ( $APV_c$ ) are calculated by the following standard formula:

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

$N$  = number of years in the forecast period (in this analysis, 20 years)

<sup>a</sup> 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.)

## CHAPTER 3 | POTENTIAL ECONOMIC IMPACTS TO LIVESTOCK GRAZING ACTIVITIES

80. This chapter provides an analysis of potential economic impacts to livestock grazing activities associated with sage-grouse conservation. In particular, this chapter considers the potential for livestock grazing restrictions and other grazing management changes. The chapter proceeds as follows: Section 3.1 first discusses the scope and scale of livestock grazing activities within the proposed designation. Section 3.2 summarizes existing baseline conservation efforts, and section 3.3 discusses the types of additional conservation efforts that may be requested following the designation of critical habitat. Section 3.4 then presents our analytical approach and estimation of baseline impacts. Section 3.5 presents the estimation of incremental impacts. Section 3.6 discusses potential regional economic impacts associated with baseline and incremental conservation. Section 3.7 specifically addresses impacts to Tribal grazing operations within proposed critical habitat. Finally, section 3.8 summarizes the results, and section 3.9 discusses key uncertainties of the analysis.

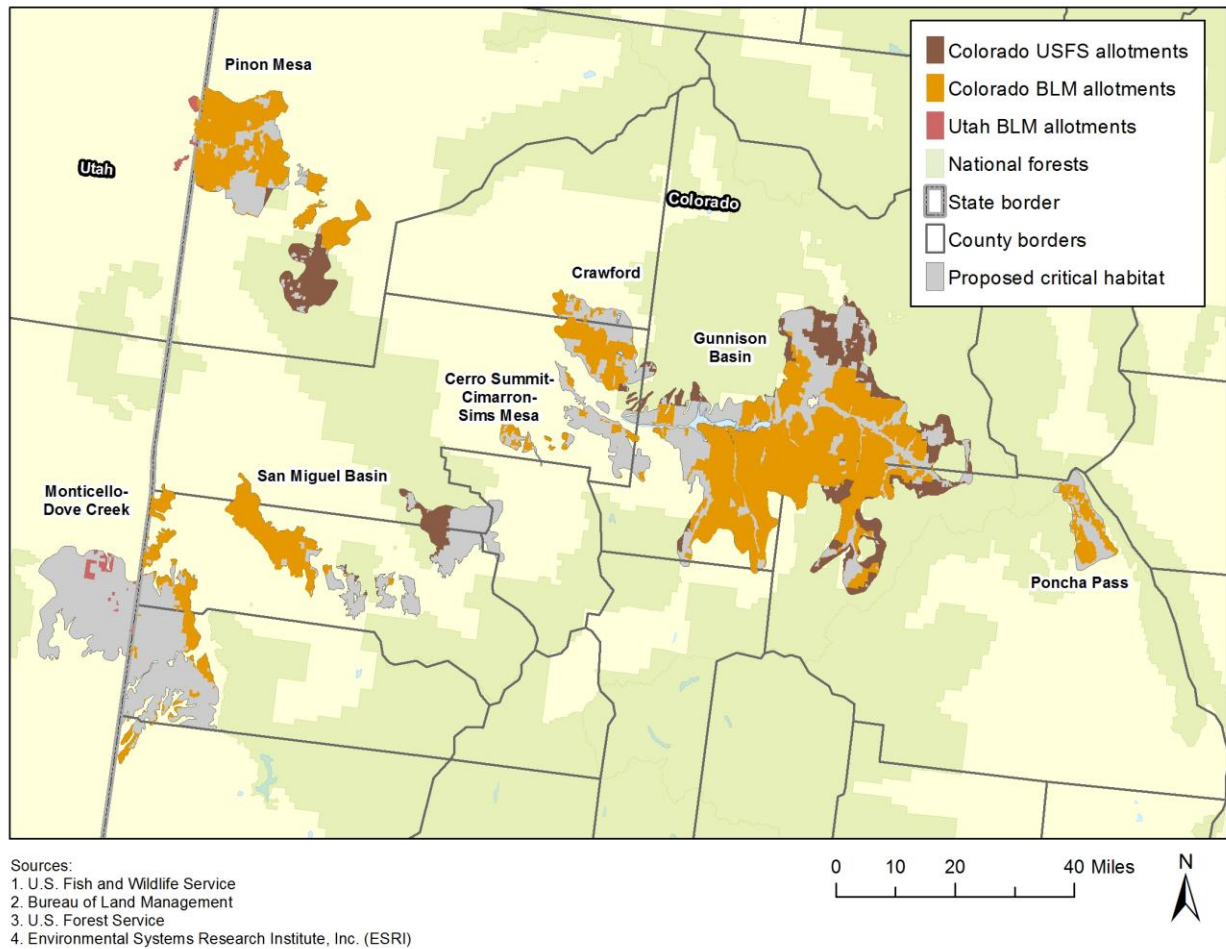
### 3.1 SCOPE AND SCALE OF LIVESTOCK GRAZING ACTIVITIES

81. As described in the Proposed Rule, some grazing management techniques may affect the sage-grouse and its habitat by degrading or reducing sagebrush habitat. The proposed designation is predominantly rural, and much of the area is used for grazing activities. More than 300 Federal grazing allotments are located within the proposed designation. These areas, shown in Exhibit 3-1, account for approximately 720,000 acres of occupied habitat and 260,000 acres of unoccupied habitat. Together, this represents approximately 58 percent of the proposed designation. However, livestock stocking rates in these areas have declined significantly over time, according to the Service and public comments submitted in response to the Proposed Rule.<sup>39</sup>

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<sup>39</sup> 2013 Endangered Status Proposed Rule, 78 FR 2500; and Gunnison County Board of County Commissioners. Public comment submitted on April 2, 2013. (92)

EXHIBIT 3-1. FEDERAL GRAZING ALLOTMENTS IN PROPOSED CRITICAL HABITAT



82. Although grazing on both public and private lands may affect the sage-grouse and its habitat, privately owned ranches typically lack a Federal nexus for section 7 consultation. Consultation is only anticipated for private ranches participating in Federal programs through NRCS or FSA. These activities are discussed in the following chapter in conjunction with agricultural activities. This chapter focuses on impacts to livestock grazing on allotments administered by the Bureau of Land Management (BLM) and U.S. Forest Service (USFS). As described in a public comment submitted in response to the Proposed Rule, private ranches in the Gunnison Basin are “not economically viable without the public lands grazing permits for summer grazing.”<sup>40</sup> That is, private ranches are closely tied to Federal grazing allotments, and impacts to federally managed grazing land may affect private ranchers as well.

<sup>40</sup> Washburn, Doug. Public comment submitted on behalf of Gunnison County Stockgrowers' Association, Inc. on March 29, 2013. (17)

**3.2 EXISTING BASELINE CONSERVATION EFFORTS**

83. According to the Proposed Rule, improper livestock grazing management threatens the sage-grouse and its habitat. However, grazing operations can minimize this threat by incorporating the following conservation efforts, among others:
- Maintaining vegetation structure suitable for sage-grouse;
  - Implementing pasture rotations and similar techniques to improve livestock distribution and minimize impacts to vegetation;
  - Seasonal rest of livestock grazing from sage-grouse habitat; and
  - Reducing livestock stocking rates.
84. On Federal lands, management of grazing allotments is left to the discretion of the Federal agencies responsible for permitting grazing. Federal agencies often prefer to implement management changes, such as rotational grazing or seasonal restrictions, before reducing stocking rates.<sup>41</sup> When necessary, reductions in available grazing area or stocking rates are typically realized by reducing the number of permitted Animal Unit Months (AUMs, which are a measure of the amount of forage consumed by one cow and calf during one month). Within the proposed designation, numerous existing management strategies consider the effect of livestock grazing on the sage-grouse and its habitat. These are summarized below.
- 3.2.1 GUNNISON SAGE-GROUSE RANGEWIDE CONSERVATION PLAN**
85. The sage-grouse Rangewide Conservation Plan (RCP) was completed in 2005 and establishes management guidelines throughout the range of the species. Signatories to the RCP include BLM, Colorado Parks and Wildlife (CPW), the National Park Service (NPS), NRCS, USFS, the Utah Division of Wildlife Resources, and the Service. This plan prioritizes protection of occupied habitat and restoration of unoccupied habitat. For livestock grazing, the plan suggests that maintenance or improvement of vegetation conditions “can be accomplished by controlling the distribution of grazers, duration of use, and the time of year livestock graze a particular location.” In particular, the RCP recommends:
- Seasonal use to allow for vegetation regrowth;
  - Pasture rotations;
  - Minimization of grazing in riparian areas;
  - Placement of salt, minerals, or supplements away from leks;
  - Avoidance of grazing in lek areas during breeding season;
  - Development of alternative water sources to protect riparian areas; and

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<sup>41</sup> U.S. Fish and Wildlife Service and BLM Colorado State Office. Personal communication on May 20, 2013.

- Monitoring vegetation conditions.<sup>42</sup>

### 3.2.2 GUNNISON BASIN CCA

86. The Gunnison Basin Sage-Grouse Strategic Committee is currently in the process of developing a CCA for the species in the Gunnison Basin unit. The CCA will address several activities, including development, recreation, and livestock grazing, on nearly 400,000 acres of federally managed lands that are occupied by the sage-grouse. For each of these activities, the CCA will require project proponents to implement a series of conservation efforts for the benefit of the sage-grouse. Agencies expected to sign the agreement include CPW, Gunnison County, Saguache County, BLM, USFS, NPS, NRCS, and the Service.<sup>43</sup>
87. The CCA recognizes the importance of establishing grazing management strategies for federally managed allotments within sage-grouse habitat. The CCA will cover grazing permit renewals if the following conservation efforts, among others, are implemented:
- Monitoring vegetation cover and maintaining grass heights suitable for sage-grouse habitat;
  - Adjusting grazing patterns to minimize impacts to vegetation structure;
  - Developing irrigation systems to protect riparian habitat; and
  - Placing salt, minerals, and other livestock supplements farther than half a mile from sage-grouse leks.<sup>44</sup>
88. The Service expects that the Federal agencies involved in the CCA will pursue a conference opinion to address potential impacts of the CCA on the sage-grouse and its habitat.<sup>45</sup> When finalized, the CCA will cover grazing management on Federal lands in the Gunnison Basin unit.

### 3.2.3 BLM RESOURCE MANAGEMENT PLANS

89. The sage-grouse was designated as a BLM Sensitive Species in 2000, following its identification as a distinct species. This designation provides some protection to the sage-grouse and its habitat. In particular, Resource Management Plans (RMP), which are developed for each field office, are required to address sensitive species.<sup>46</sup>
90. In accordance with these RMPs, changes to allotment management have occurred over the past ten years as permits have been renewed. In addition, BLM continually adjusts

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<sup>42</sup> Gunnison Sage-Grouse Rangewide Conservation Plan. Gunnison Sage-Grouse Rangewide Steering Committee, Colorado Division of Wildlife. April 2005.

<sup>43</sup> 2013 Endangered Status Proposed Rule, 78 FR 2515.

<sup>44</sup> Gunnison Basin Sage-Grouse Strategic Committee. 2013. Draft Candidate Conservation Agreement For the Gunnison Sage-grouse, *Centrocercus minimus*, Gunnison Basin Population.

<sup>45</sup> 2013 Endangered Status Proposed Rule, 78 FR 2515.

<sup>46</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013. (10)

allowable management strategies based on conservation needs of individual allotments.<sup>47</sup> According to communication with BLM, the agency has already implemented restrictions on many allotments. These restrictions include changes to allowable seasons of use, AUM reductions, and implementation of rotational grazing systems.<sup>48</sup>

#### **3.2.4 GMUG NATIONAL FORESTS LAND AND RESOURCE MANAGEMENT PLAN**

91. The sage-grouse is also designated as a USFS Sensitive Species.<sup>49</sup> USFS administers grazing allotments within the Grand Mesa, Uncompahgre, and Gunnison (GMUG) National Forests in the Piñon Mesa, San Miguel Basin, Crawford, and Gunnison Basin units. The Land and Resource Management Plan for the GMUG National Forests identifies guidelines for grazing management that are intended to benefit the sage-grouse and its habitat. For example, allowable herd size and management strategies are determined annually based on site-specific factors, such as vegetation conditions. According to land managers at the GMUG National Forests, allowable utilization (i.e., the percent of forage harvested by livestock) varies from 30-65 percent within most of the sage-grouse range. Additionally, the guidelines identify a preferred grass height – approximately four to six inches – that should be maintained on all allotments. Conservation efforts implemented to maintain these conditions include pasture rotations, avoidance of grazing during sage-grouse breeding season, exclusion of important sage-grouse habitat from grazing areas, and AUM reductions. Conservation efforts for the sage-grouse have been implemented over a number of years as permits and environmental analyses have been revised or renewed.<sup>50</sup>

#### **3.2.5 RANGE MANAGEMENT SCHOOL**

92. In 2006, the Gunnison County Stockgrowers' Association, supported by a Grazing Lands Conservation Initiative Grant, organized a training workshop - called Range Management School - for 37 participants, including private ranchers, permittees of Federal grazing allotments, Federal land managers, and other interested parties. Range Management School, which was introduced in 1995, is an educational program that provides detailed information about best management and monitoring practices to ensure protection of the sage-grouse and its habitat. Because many local landowners may consider participating in CPW's existing Candidate Conservation Agreement with Assurances (CCAA) for the sage-grouse, Range Management School focused on providing participants with knowledge and practical training that would benefit the sage-grouse and its habitat. In particular, topics addressed included vegetation growth, responses to drought, duration and timing of grazing, habitat monitoring, and animal behavior. Range Management

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<sup>47</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 3, 2013.

<sup>48</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 29, 2013.

<sup>49</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013. (11)

<sup>50</sup> Liston, Kelley. Range Conservationist, Grand Mesa Uncompahgre and Gunnison National Forests, Ouray Ranger District. Personal communication on April 11, 2013.



School received a letter of support from NRCS, and emphasizes a cooperative relationship between permittees and Federal land managers.<sup>51</sup>

### 3.3 POTENTIAL INCREMENTAL CONSERVATION EFFORTS

93. Several public comments submitted in response to the Proposed Rule express concern that grazing permits on Federal lands could be reduced or eliminated due to the designation of critical habitat.<sup>52</sup> As described in Chapter 2, conservation efforts requested to avoid adverse modification of critical habitat are expected to be similar to those requested to avoid jeopardy to the species. Since livestock grazing is not expected to result in significant alteration of habitat, we do not forecast additional project modifications beyond what would be requested to avoid jeopardy to the species. These types of conservation efforts, described in the previous section, include AUM reductions, seasonal restrictions, rotational grazing, and other changes to grazing patterns. The Service does not intend to preclude grazing within the proposed designation, nor do they believe they have the authority to do so, but would instead seek project modifications when necessary.<sup>53</sup>

### 3.4 BASELINE IMPACTS

94. According to representatives of BLM and USFS, these agencies have implemented AUM reductions or other changes to grazing management for many allotments within the proposed designation in recent years.<sup>54</sup> This analysis assumes that these types of conservation efforts will result in impacts to ranching activity and focuses on quantifying costs associated with potential grazing restrictions. Changes to grazing patterns, which are often the preferred management strategy of Federal agencies, may result in a loss of livestock management flexibility, and could impose costs associated with the additional effort required for monitoring and moving livestock. Information allowing for the monetization of these potential impacts is not available. However, we assume that the loss of forage associated with permitted AUMs represents the highest cost a rancher could face. That is, if required changes to grazing patterns are more costly than the worth of grazed AUMs, a rancher will choose to reduce herd size instead. Therefore, potential impacts quantified in this chapter consist of:

- **AUM Reductions.** AUM reductions represent the highest cost a rancher is likely to incur. Reductions are not assumed to occur on allotments with minimal overlap with the proposed designation.<sup>55</sup> AUM reductions are also not forecast

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<sup>51</sup> Washburn, Doug. Public comment submitted on behalf of Gunnison County Stockgrowers' Association, Inc. on March 29, 2013. (9)

<sup>52</sup> See, for example: Washburn, Doug. Public comment submitted on behalf of Gunnison County Stockgrowers' Association, Inc. on March 29, 2013; and Livestock Associations. Public comment submitted on April 2, 2013.

<sup>53</sup> U.S. Fish and Wildlife Service. Personal communication on May 17, 2013.

<sup>54</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 3, 2013; and Liston, Kelley. Range Conservationist, Grand Mesa Uncompahgre and Gunnison National Forests, Ouray Ranger District. Personal communication on April 11, 2013.

<sup>55</sup> Liston, Kelley. Range Conservationist, Grand Mesa Uncompahgre and Gunnison National Forests, Ouray Ranger District. Personal communication on April 11, 2013.

for allotments identified as unlikely to be affected using information provided by USFS and BLM. These allotments include those that have previously had AUMs reduced for sage-grouse conservation; those that had permits renewed and AUMs re-evaluated in the last 10 years; and those that underwent changes following environmental assessments in the last 10 years. This assumption is based on statements from BLM and USFS that the agencies have been addressing sage-grouse conservation and phasing in changes to allotment management over the last decade.<sup>56</sup> AUM reductions are assumed to be possible for all remaining allotments. Of the 310 allotments overlapping the proposed designation, this analysis considers potential AUM reductions on 107. These 107 allotments account for 28 percent of Federal grazing acres within occupied critical habitat, and 56 percent of Federal grazing acres within unoccupied habitat. For allotments located within occupied habitat, any future AUM reductions are considered baseline impacts. For allotments in unoccupied habitat, future AUM reductions are considered incremental impacts.

- **Administrative Costs.** These impacts consist of the administrative effort associated with programmatic section 7 consultations to address grazing activities on Federal lands. Costs associated with jeopardy analyses in occupied habitat are considered baseline impacts; additional costs associated with adverse modification analyses in these areas, as well as all consultation costs in unoccupied habitat, are considered incremental impacts. Section 7 consultations are assumed to occur at the field office level.<sup>57</sup>

95. The remainder of this section discusses the approach to quantifying these categories of impacts in more detail.

#### 3.4.1 AUMS AND PERMIT VALUE ON FEDERAL LANDS

96. Both BLM and USFS offer grazing permits for public lands. Each allotment is assigned a specific number of AUMs based on conditions on that allotment, and the permits are then sold to private ranchers for a period of approximately 10 years. Numerous published studies have found that a rancher obtains value for holding a Federal grazing permit beyond the fee charged for that permit.<sup>58</sup> Thus, permit value can be used as a measure of

<sup>56</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 3, 2013; and Liston, Kelley. Range Conservationist, Grand Mesa Uncompahgre and Gunnison National Forests, Ouray Ranger District. Personal communication on April 11, 2013.

<sup>57</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 30, 2013.

<sup>58</sup> "The general observation is that public land grazing permits do have market value," Torell et al. 2001. "The Lack of Profit motive for ranching: Implications for policy analysis." Current issues in Rangeland Economics, Western Coordinating Committee 55 (WCC-55); Torell, L. Allen and S.A. Bailey. 1991. "Public land policy and the value of grazing permits." Western Journal of Agricultural Economics, Volume 16 (174-184). Also see: Rowan, R. C., and J.P. Workman. 1992. "Factors affecting Utah ranch prices." Journal of Range Management, Volume 45 (263-266); Sunderman, M. A. and R. Spahr. 1992. "Valuation of government grazing leases." Journal of Real Estate Research, Volume 9 (179-196); Spahr, R. and M.A. Sunderman. 1995. "Additional evidence on the homogeneity of the value of government grazing leases and changing attributes for ranch value." Journal of Real Estate Research, Volume 10 (601-616); Torell, L. Allen and M.E. Kincaid. 1996. "Public land policy and the market value of New Mexico ranches, 1979-1994." Journal of Range Management, Volume 49

rancher wealth, and required reductions in permitted AUMs can be represented by a loss in permit value. Exhibit 3-2 presents the results of nine studies that attempt to measure the per-AUM permit value, in perpetuity, associated with grazing on BLM and USFS land.<sup>59</sup> This analysis assumes the average of the permit values below, or \$105 per BLM AUM and \$96 per USFS AUM.

**EXHIBIT 3-2. PERMIT VALUES FOR BLM AND USFS PERMITS**

STUDY	YEARS	LOCATION	\$ / BLM AUM (2012\$)*	\$ / USFS AUM (2012\$)*
Rowen & Workman	1975-1987	Utah	\$38	\$38
Torell & Doll	1979-1988	New Mexico	\$116	\$116
Rowen & Workman	1980-1988	Utah	\$72	\$72
Torell & Kincaid	1988	New Mexico	\$128	\$119
Torell et al.	1992	New Mexico	\$131	\$106
Kincaid	1987-1994	New Mexico	\$120	\$117
Torell & Kincaid	1994	New Mexico	\$123	\$85
Torell et al.	2002	Idaho, Nevada, Oregon	\$113	\$113
<b>Average</b>			<b>\$105</b>	<b>\$96</b>
<p>* Numbers represent the permit value per AUM in perpetuity. Values adjusted to 2012\$ using the National Income and Product Accounts Table, Table 1.1.4 Price Indexes for Gross Domestic Product, annual values. U.S. Department of Commerce Bureau of Economic Analysis.</p> <p>Sources: Stern, Bill S. "Permit Value: A Hidden Key to the Public Lands Grazing Dispute," University of Montana, Master of Science thesis, 1998; Torell et al., "Ranch level impacts of changing grazing policies on BLM land to protect the Greater Sage-Grouse: Evidence from Idaho, Nevada, and Oregon." Policy Analysis Center for Western Public Lands, Policy Paper SGB01B02, 2002.</p>				

97. Importantly, numerous factors affect the number of permitted AUMs approved for any given allotment. These factors are site-specific and include vegetation characteristics, drought or other climatic conditions, current grazing system, and the presence of other sensitive species or ecosystems. AUM reductions due to sage-grouse conservation often cannot be separated from other causes. This analysis conservatively attributes the full value of lost AUMs to sage-grouse conservation. In addition, this analysis cannot determine whether AUM reductions will be required for a given allotment without site-

(270-276); and Bartlett, E. Tom, et al. 2002. "Valuing grazing use on public land." *Journal of Range Management*. Volume 55 (426-438).

<sup>59</sup> There has not been a significant volume of research performed on permit values in recent years; however, one 2012 study presents results of a hedonic model consistent with the estimates used here. (see Torell et al. 2012. "The Market Value of Ranches and Grazing Permits in New Mexico, 1996 to 2010." New Mexico State University. Research Report 779.) In addition, experts in the field consider the values used in this economic analysis to be reasonable. (McCarl, Bruce. Technical review comments on June 11, 2013.)

specific data. Therefore, forecast AUM reductions represent a conservative estimate of potential impacts.

98. In some cases, range managers can avoid AUM reductions by implementing other changes in grazing management practices.<sup>60</sup> For example, if a small number of acres are affected relative to the entire allotment, range managers may be able to alter grazing patterns to avoid those areas during biologically critical time periods. Alternative approaches to grazing management may result in other costs to ranchers, resulting from a loss of management flexibility. However, data allowing for quantification of such impacts are not available. To avoid underestimating costs, we assume allotments will face AUM reductions equal to the proportion of allotment area overlapping critical habitat. In practice, proportional reductions in AUMs are unlikely to occur as a result of critical habitat designation. However, this assumption represents a reasonably conservative scenario – more likely to overstate than understate costs – and thus avoids underestimating the potential economic impacts of critical habitat designation on livestock grazing.

#### 3.4.2 ANALYTICAL APPROACH AND RESULTS

99. To estimate costs associated with AUM reductions, we first identify those allotments that could face reductions. This includes eliminating 58 allotments overlapping the proposed designation by five percent of allotment area or less. We also eliminate 145 allotments that are unlikely to be affected by sage-grouse conservation, as identified by Federal range managers. These allotments include those that are vacant and those that have had permits renewed and effects on sage-grouse evaluated since 2004. This last category includes allotments that have already incurred AUM reductions or other management changes.
100. For the remaining 107 allotments, we assume that AUM reductions due to sage-grouse conservation are proportional to the percentage of allotment area proposed for critical habitat designation. Where permitted AUMs are not known for a given allotment, we assume the average number of AUMs per acre, as calculated for all other allotments administered by that agency (i.e., Colorado BLM, Colorado USFS, or Utah BLM). On average, we estimate AUM reductions of approximately 64 percent across these 107 allotments. We then apply the values per-AUM reduced presented above.
101. Assuming AUM reductions proportional to the overlap with critical habitat may, in some cases, overstate impacts. Information provided by USFS and BLM suggests that many allotments that are entirely contained within the proposed designation have had permits renewed in recent years without AUM reductions. Other allotments have required significant reductions in AUMs, in addition to other management changes. Previous AUM reductions for allotments entirely within the proposed designation range from zero

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<sup>60</sup> Liston, Kelley. Range Conservationist, Grand Mesa Uncompahgre and Gunnison National Forests, Ouray Ranger District. Personal communication on April 11, 2013.

(for many allotments) to 100 percent of permitted AUMs (for a few allotments).<sup>61, 62</sup> Data limitations do not allow for the calculation of an average AUM reduction per acre of overlap. As a result, we assume proportional reductions and note that this is likely to result in an overestimate of total impacts.

102. Within occupied habitat, our analysis estimates that approximately 15 AUMs will be reduced on BLM allotments in Utah; 2,200 on USFS allotments in Colorado; and 7,700 on BLM allotments in Colorado. Baseline impacts associated with these reductions are shown in Exhibit 3-3.

**EXHIBIT 3-3. FORECAST BASELINE IMPACTS RESULTING FROM AUM REDUCTIONS (2012\$)**

UNIT	PRESENT VALUE (ESTIMATED IN PERPETUITY)
Monticello-Dove Creek	\$110,000
Piñon Mesa	\$120,000
San Miguel Basin	\$37,000
Cerro Summit-Cimarron-Sims Mesa	\$11,000
Crawford	\$130,000
Gunnison Basin	\$610,000
Poncha Pass	\$1,300
<b>Total</b>	<b>\$1,000,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.	

103. To estimate administrative impacts, we forecast one programmatic consultation per field office. Specifically, this analysis assumes eight programmatic section 7 consultations in 2013 for livestock grazing activities occurring within the jurisdiction of the following field offices:

- Grand Junction BLM;
- Gunnison BLM;
- San Luis Valley BLM;
- Tres Rios BLM;
- Uncompahgre BLM;

<sup>61</sup> Liston, Kelley. Range Conservationist, Grand Mesa Uncompahgre and Gunnison National Forests, Ouray Ranger District. Personal communication on April 11, 2013; and Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 29, 2013.

<sup>62</sup> Information provided by BLM may not reflect the most current or complete data. For example, BLM provided allotment information from 2009 for four sage-grouse populations, plus a 2011 update for the Gunnison Basin field office and a 2012 summary from the Tres Rios field office. In general, this information addresses allotments in occupied habitat.

- Moab BLM;
- Monticello BLM; and
- GMUG National Forests.

Costs of these eight consultations are allocated to critical habitat units proportionally based on the percent of each field office's administrative area overlapping each unit. We assume that all consultations will address both jeopardy to the species and adverse modification of critical habitat.

104. Exhibit 3-4 presents the results of the baseline analysis, including costs associated with both AUM reductions and programmatic consultations. Baseline impacts are estimated to be approximately \$1.2 million (present value over 20 years), discounted at seven percent.

**EXHIBIT 3-4. FORECAST BASELINE IMPACTS TO GRAZING ACTIVITIES, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$150,000	\$13,000
Piñon Mesa	\$190,000	\$16,000
San Miguel Basin	\$54,000	\$4,700
Cerro Summit-Cimarron-Sims Mesa	\$17,000	\$1,500
Crawford	\$150,000	\$13,000
Gunnison Basin	\$650,000	\$58,000
Poncha Pass	\$28,000	\$2,500
<b>Total</b>	<b>\$1,200,000</b>	<b>\$110,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

### 3.5 INCREMENTAL IMPACTS

105. To estimate incremental impacts, we apply the same methodology described above. We consider AUM reductions on allotments within unoccupied critical habitat and administrative costs associated with the consideration of adverse modification.
106. Within unoccupied habitat, our analysis estimates that approximately 42 AUMs will be reduced on BLM allotments in Utah; 7,400 on USFS allotments in Colorado; and 3,500 on BLM allotments in Colorado. Incremental impacts associated with these reductions are shown in Exhibit 3-5.

**EXHIBIT 3-5. FORECAST INCREMENTAL IMPACTS RESULTING FROM AUM REDUCTIONS (2012\$)**

UNIT	PRESENT VALUE (ESTIMATED IN PERPETUITY)
Monticello-Dove Creek	\$130,000
Piñon Mesa	\$560,000
San Miguel Basin	\$320,000
Cerro Summit-Cimarron-Sims Mesa	\$19,000
Crawford	\$49,000
Gunnison Basin	\$1,700
Poncha Pass	\$2,700
<b>Total</b>	<b>\$1,100,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.	

107. In Exhibit 3-6, we summarize the results of the incremental analysis. These results include both the costs associated with AUM reductions and the portion of administrative effort to consider adverse modification in eight programmatic consultations. Incremental impacts are estimated to be approximately \$1.2 million (present value over 20 years), discounted at seven percent.

**EXHIBIT 3-6. FORECAST INCREMENTAL IMPACTS TO GRAZING ACTIVITIES, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$150,000	\$13,000
Piñon Mesa	\$580,000	\$51,000
San Miguel Basin	\$330,000	\$29,000
Cerro Summit-Cimarron-Sims Mesa	\$21,000	\$1,900
Crawford	\$56,000	\$4,900
Gunnison Basin	\$16,000	\$1,400
Poncha Pass	\$12,000	\$1,000
<b>Total</b>	<b>\$1,200,000</b>	<b>\$100,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		



### 3.6 REGIONAL ECONOMIC IMPACTS

108. This section discusses the regional economic impacts that may result from reductions in AUMs. To estimate the regional economic impact of grazing restrictions, this analysis first estimates the number of AUMs that may be lost as a result of sage-grouse conservation, conservatively assuming that replacement forage is either not available or is prohibitively expensive. The above analysis estimates:

- Approximately 9,900 AUMs reduced on Federal grazing lands due to sage-grouse conservation occurring under the baseline.
- Approximately 11,000 AUMs reduced on Federal grazing lands as an incremental impact of sage-grouse critical habitat designation.

109. Direct effects are calculated by converting these AUM reductions to estimated losses in livestock production. Next, the analysis utilizes a regional economic modeling software package, IMPLAN, to estimate indirect and induced impacts on the region in terms of output and jobs.

#### 3.6.1 RUNNING THE IMPLAN MODEL

110. Restrictions in grazing activity would primarily affect livestock-related sectors of the economy. Decreased operations in these industries could also result in secondary effects to related sectors in the study area. Some of these related sectors may be closely associated with the livestock industry, such as feed grains and hay and pasture; while others may be less closely associated, such as the insurance sector.

111. This analysis relies on regional economic modeling to estimate the economic impacts of these initial and secondary effects. In particular, it utilizes a software package called IMPLAN to estimate the total economic effects of the reduction in economic activity in livestock-related industries. IMPLAN is commonly used by state and Federal agencies for policy planning and evaluation. The model draws upon data from several Federal and state agencies, including the Bureau of Economic Analysis and the Bureau of Labor Statistics.

112. IMPLAN translates initial changes in expenditures into changes in demand for inputs from affected industries. These effects can be described as direct, indirect, or induced:

- **Direct effects** represent changes in output attributable to a change in demand or a supply shock. These are specified initially by the modeler;
- **Indirect effects** are changes in output in industries that supply goods and services to those that are directly affected by the initial change in expenditures; and
- **Induced effects** reflect changes in household consumption, arising from changes in employment (which in turn are the result of direct and indirect effects). For example, changes in employment in a region may affect the consumption of certain goods and services.

113. These categories are calculated for all industries to determine the regional economic impact of grazing restrictions resulting from sage-grouse conservation. For purposes of

this regional analysis, the study area includes the 12 counties in Colorado and Utah in which sage-grouse critical habitat is proposed. While it is possible to run the IMPLAN model at the individual county level, some impacts could “leak out” of the analysis at that fine scale and could cause impacts to appear smaller.

### 3.6.2 CAVEATS TO THE IMPLAN MODEL

114. There are two important caveats to interpretation of IMPLAN estimates. The first is that the model is static in nature and measures only those effects resulting from a specific policy change (or the functional equivalent specified by the modeler) at a single point in time. Thus, IMPLAN does not account for adjustments that may occur, such as the reemployment of workers displaced by the original policy change. In the context of this analysis, this suggests that the long-run net output and employment effects resulting from grazing restrictions are likely to be smaller than those estimated in the model.
115. A second caveat to the IMPLAN analysis is related to the model data. The IMPLAN analysis relies upon input/output relationships derived from 1998 data. Thus, this analysis assumes that this historical characterization of the affected counties' economies is a reasonable approximation of current conditions. If significant changes have occurred since 1998 in the structure of the economies of the counties in the study area, the results may be sensitive to this assumption. The magnitude and direction of any such bias are unknown.

### 3.6.3 REGIONAL ECONOMIC IMPACT ESTIMATES

116. Future regional economic impacts are estimated for both baseline and incremental estimates of lost AUMs. The calculation of the direct effect of future reductions in AUMs on annual livestock production relies on the following assumptions:
  - The 2012 average livestock production value, per head, in Colorado and Utah is \$1,215;<sup>63</sup> and
  - Annual value per head is converted to annual value per AUM (\$68) by dividing by 18. This calculation assumes one calf per cow and a monthly requirement of 0.5 AUMs per calf.<sup>64</sup>

Exhibits 3-7 and 3-8 present the results of the IMPLAN analysis for the baseline and incremental scenarios, respectively. Future baseline reductions in livestock production are shown to result in an annual economic loss of approximately \$1.4 million in regional output and approximately 12 jobs across all sectors of the economy. This impact represents less than one percent of total output and employment from the livestock industry in this region. Future incremental reductions in livestock production result in an annual economic loss of approximately \$1.5 million in regional output and 14 jobs across

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<sup>63</sup> NASS Quick Stats. Value of cattle, including calves - inventory, measured in \$/head, 2012.

<sup>64</sup> Lewandrowski, Jan and K. Ingram. “Restricting Grazing on Federal Lands in the West to Protect Threatened and Endangered Species: Ranch and Livestock Sector Impacts.” Review of Agricultural Economics, Volume 24, Number 1 (78-107).

all sectors of the economy. This impact represents less than one percent of total output and employment from the livestock industry in this region.<sup>65</sup>

**EXHIBIT 3-7. FORECAST ANNUAL BASELINE REGIONAL ECONOMIC IMPACT FROM GRAZING REDUCTIONS (2012\$)**

UNIT	ESTIMATED AUM REDUCTION	DIRECT PRODUCTION LOSS	INDIRECT EFFECT	INDUCED EFFECT	TOTAL IMPACT
Monticello-Dove Creek	1,000	\$68,000	\$59,000	\$11,000	\$140,000
Piñon Mesa	1,200	\$80,000	\$70,000	\$13,000	\$160,000
San Miguel Basin	360	\$24,000	\$21,000	\$4,100	\$50,000
Cerro Summit-Cimarron-Sims Mesa	110	\$7,200	\$6,200	\$1,200	\$15,000
Crawford	1,200	\$83,000	\$72,000	\$14,000	\$170,000
Gunnison Basin	6,000	\$410,000	\$350,000	\$67,000	\$820,000
Poncha Pass	12	\$810	\$700	\$130	\$1,600
<b>Total</b>	<b>9,900</b>	<b>\$670,000</b>	<b>\$580,000</b>	<b>\$110,000</b>	<b>\$1,400,000</b>
<b>Total - Jobs</b>	<b>n/a</b>	<b>7.0</b>	<b>4.4</b>	<b>0.92</b>	<b>12</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.					

**EXHIBIT 3-8. FORECAST ANNUAL INCREMENTAL REGIONAL ECONOMIC IMPACT FROM GRAZING REDUCTIONS (2012\$)**

UNIT	ESTIMATED AUM REDUCTION	DIRECT PRODUCTION LOSS	INDIRECT EFFECT	INDUCED EFFECT	TOTAL IMPACT
Monticello-Dove Creek	1,300	\$85,000	\$74,000	\$14,000	\$170,000
Piñon Mesa	5,700	\$380,000	\$330,000	\$63,000	\$780,000
San Miguel Basin	3,400	\$230,000	\$200,000	\$38,000	\$460,000
Cerro Summit-Cimarron-Sims Mesa	180	\$12,000	\$11,000	\$2,000	\$25,000
Crawford	480	\$32,000	\$28,000	\$5,300	\$65,000
Gunnison Basin	16	\$1,100	\$950	\$180	\$2,200
Poncha Pass	26	\$1,700	\$1,500	\$290	\$3,500
<b>Total</b>	<b>11,000</b>	<b>\$740,000</b>	<b>\$640,000</b>	<b>\$120,000</b>	<b>\$1,500,000</b>
<b>Total - Jobs</b>	<b>n/a</b>	<b>7.8</b>	<b>4.9</b>	<b>1.0</b>	<b>14</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.					

<sup>65</sup> These data are from IMPLAN for the Range-Fed, Ranch-Fed and Cattle Feedlots livestock sectors.

### 3.7 IMPACTS TO TRIBAL ACTIVITIES

117. Approximately 12,000 acres of fee land belonging to the Ute Mountain Ute Tribe are included within the boundaries of proposed critical habitat.<sup>66</sup> This land is part of the 20,000-acre Pinecrest Ranch, which supplements Tribal grazing operations. Pinecrest Ranch is located within the Gunnison Basin unit, almost entirely within occupied habitat.<sup>67</sup>
118. Given the unique characteristics of Tribal economies, the approach used to analyze impacts on Tribal lands is different than that for other types of activities. This section provides a qualitative discussion of economic conditions within the Ute Mountain Ute Tribe, as well as potential baseline and incremental impacts of critical habitat designation.

#### 3.7.1 IMPACTS TO TRIBAL SOVEREIGNTY

119. Native American Tribes are considered sovereign nations, and therefore have a unique relationship with the U.S. government. As stated in Executive Order 13175:

The United States has a unique legal relationship with Indian Tribal governments as set forth in the Constitution of the United States, treaties, statutes, Executive Orders, and court decisions. Since the formation of the Union, the United States has recognized Indian Tribes as domestic dependent nations under its protection. The Federal Government has enacted numerous statutes and promulgated numerous regulations that establish and define a trust relationship with Indian Tribes.<sup>68</sup>

A recent presidential memorandum further charged executive departments and agencies with “engaging in regular and meaningful consultation and collaboration with Tribal officials in the development of Federal policies that have Tribal implications.”<sup>69</sup>

120. Department of Interior Secretarial Order 3206 recognizes that Tribes have governmental authority and the desire to protect and manage their resources in the manner that is most beneficial to them.<sup>70</sup> In addition, as trustee for land held by the United States for Indian Tribes, the Bureau of Indian Affairs (BIA) provides technical assistance to the Tribes and oversees a variety of programs on Tribal lands. In the context of previous critical habitat designations for other species, several Tribes have expressed concern that “the Secretary of the Interior lacks legal authority to designate critical habitat on the Nation’s lands.”<sup>71</sup>

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<sup>66</sup> U.S. Fish and Wildlife Service Western Colorado Field Office. Biologist. Personal communication on May 13, 2013.

<sup>67</sup> *Ibid.*

<sup>68</sup> Executive Order 13175, Consultation and Coordination with Indian Tribal Governments.

<sup>69</sup> White House, Memorandum for the Heads of Executive Departments and Agencies: Subject: Tribal Consultation, November 5, 2009. Accessed at: <http://www.whitehouse.gov/the-press-office/memorandum-Tribal-consultation-signed-president>.

<sup>70</sup> Department of Interior, Secretarial Order # 3206: Subject: American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act, June 1997.

<sup>71</sup> See, for example: Montgomery, Susan B., Special Legal Counsel to the Yavapai-Apache Nation. Public comment submitted in response to the Proposed Rule for designation of Southwestern willow flycatcher critical habitat on October 14, 2011.

121. Of particular concern to Tribes is generally the potential impact of regulation on Tribal land management activities, including the concern that, due to Federal oversight, the Tribe may be compelled to modify current plans for resource use. Although information on specific concerns and potentially affected activities was not available from the Ute Mountain Ute Tribe, this section provides general information about the scope of potential impacts.

### 3.7.2 OVERVIEW OF THE UTE MOUNTAIN UTE TRIBE

122. The Ute Mountain Ute Reservation is located primarily in southwest Colorado but extends into New Mexico and Utah. Pinecrest Ranch, which is approximately 100 miles northeast of the Reservation, was purchased by the Tribe in 1957 as summer grazing land and is located near the City of Gunnison in Gunnison County.<sup>72</sup> Approximately 12,000 acres of Pinecrest Ranch (60 percent) have been proposed for critical habitat designation. Most of this area is located within the occupied portion of the Gunnison Basin unit; a small number of acres overlaps unoccupied habitat.
123. Data from the 2011 American Community Survey demonstrate the economic vulnerability of the Tribe.<sup>73</sup> Estimates of unemployment, per capita income, and poverty rates are shown for the Tribe, Gunnison County (the location of Pinecrest Ranch), and the State of Colorado in Exhibit 3-9.

**EXHIBIT 3-9. ECONOMIC CHARACTERISTICS OF UTE MOUNTAIN UTE TRIBE COMPARED TO COUNTY AND STATE**

ECONOMIC CHARACTERISTIC	UTE MOUNTAIN UTE TRIBE	GUNNISON COUNTY	STATE OF COLORADO
Population	1,583	15,274	4,966,061
Unemployment Rate	9.1%	6.6%	9.3%
Per Capita Income	\$12,456	\$28,862	\$29,804
Poverty Rate	29%	14%	14%
Source: U.S. Census Bureau, 2007-2011 American Community Survey 5-Year Estimates.			

124. The Tribe's economy includes tourism, mineral extraction, and livestock grazing. The Tribe opened the Ute Mountain Casino in 1992, which employed more than 430 people in 2004, over half of which were Tribal members. Additionally, coal and oil and gas leases provide a large portion of the Tribe's revenue. Livestock grazing occurs both on the Reservation and on fee lands, including Pinecrest Ranch.<sup>74</sup>

<sup>72</sup> Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (512-516)

<sup>73</sup> U.S. Census Bureau, 2007-2011 American Community Survey 5-Year Estimates.

<sup>74</sup> Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (512-516)

### 3.7.3 POTENTIALLY AFFECTED ACTIVITIES

125. Due to the trust relationship between the United States and Native American Tribes, a significant number of Tribal programs, activities, and development projects involve Federal funding or oversight. Therefore, where critical habitat is designated on Tribal lands, nearly all projects could have a Federal nexus for section 7 consultation.<sup>75</sup> Because of the location of Pinecrest Ranch within proposed critical habitat, livestock grazing activities may be affected. Given the probability of a Federal nexus, we assume that the Tribe will incur administrative impacts associated with one formal consultation in 2013 for operation of the ranch. We forecast baseline impacts to the Tribe of approximately \$15,000 (present value over 20 years), associated with the consideration of jeopardy to the species, and incremental impacts of \$5,000 (present value over 20 years), associated with the consideration of adverse modification. These impacts are shown in Exhibits 3-10 and 3-11.
126. In addition, the Service and the Ute Mountain Ute Tribe are coordinating to develop a conservation plan that should minimize impacts to the Tribe resulting from the listing of the species or critical habitat designation.<sup>76</sup> We are unable to predict the probability that conservation efforts will be requested by the Service for livestock grazing or other activities on Pinecrest Ranch. However, unique circumstances of Tribal communities may affect re-employment opportunities if ranch operations are affected. For example, Tribal members may be less mobile than non-Tribal members, and Tribal members who lose jobs may be hesitant to find work outside of the Tribal community. Thus, if sage-grouse conservation affects employment opportunities on Pinecrest Ranch, those impacts may be compounded by poor baseline economic conditions and a lack of alternative employment opportunities. Such impacts would represent an additional cost beyond the administrative impacts described above.

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<sup>75</sup> See, for example: Montgomery, Susan B., Montgomery & Interpreter, plc. Public comment submitted on behalf of the Yavapai-Apache Nation on December 27, 2010.

<sup>76</sup> U.S. Fish and Wildlife Service. Personal communication on June 21, 2013.

**EXHIBIT 3-10. FORECAST BASELINE IMPACTS TO TRIBAL ACTIVITIES, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$0	\$0
Piñon Mesa	\$0	\$0
San Miguel Basin	\$0	\$0
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0
Crawford	\$0	\$0
Gunnison Basin	\$15,000	\$1,300
Poncha Pass	\$0	\$0
<b>Total</b>	<b>\$15,000</b>	<b>\$1,300</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT 3-11. FORECAST INCREMENTAL IMPACTS TO TRIBAL ACTIVITIES, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$0	\$0
Piñon Mesa	\$0	\$0
San Miguel Basin	\$0	\$0
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0
Crawford	\$0	\$0
Gunnison Basin	\$5,000	\$440
Poncha Pass	\$0	\$0
<b>Total</b>	<b>\$5,000</b>	<b>\$440</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**3.8 SUMMARY OF RESULTS**

127. This analysis forecasts baseline impacts to livestock grazing activities of \$2.7 million (present value over 20 years), discounted at seven percent. Approximately \$2.5 million of these impacts are associated with potential AUM reductions on Federal grazing allotments. This analysis forecasts incremental impacts of \$1.5 million (present value over 20 years), of which \$1.4 million are associated with potential AUM reductions on Federal allotments. The remainder of both baseline and incremental impacts are associated with eight programmatic consultations to address livestock grazing on Federal



lands, and one formal consultation to address livestock grazing on Tribal fee lands. Exhibits 3-12 and 3-13 present these results by proposed critical habitat unit.

**EXHIBIT 3-12. FORECAST BASELINE IMPACTS TO GRAZING ACTIVITIES, INCLUDING TRIBAL IMPACTS, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$150,000	\$13,000
Piñon Mesa	\$190,000	\$16,000
San Miguel Basin	\$54,000	\$4,700
Cerro Summit-Cimarron-Sims Mesa	\$17,000	\$1,500
Crawford	\$150,000	\$13,000
Gunnison Basin	\$670,000	\$59,000
Poncha Pass	\$28,000	\$2,500
<b>Total</b>	<b>\$1,300,000</b>	<b>\$110,000</b>
<p><b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.</p> <p>Tribal impacts in the Gunnison Basin unit (\$15,000 present value) are relatively small and thus may not show up in rounded present or annualized values.</p>		

**EXHIBIT 3-13. FORECAST INCREMENTAL IMPACTS TO GRAZING ACTIVITIES, INCLUDING TRIBAL IMPACTS, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$150,000	\$13,000
Piñon Mesa	\$580,000	\$51,000
San Miguel Basin	\$330,000	\$29,000
Cerro Summit-Cimarron-Sims Mesa	\$21,000	\$1,900
Crawford	\$56,000	\$4,900
Gunnison Basin	\$21,000	\$1,900
Poncha Pass	\$12,000	\$1,000
<b>Total</b>	<b>\$1,200,000</b>	<b>\$100,000</b>
<p><b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.</p> <p>Tribal impacts in the Gunnison Basin unit (\$5,000 present value) are relatively small and thus may not show up in rounded present or annualized values.</p>		

### 3.9 KEY UNCERTAINTIES

128. Exhibit 3-14 summarizes the key assumptions of the analysis of economic impacts to grazing activities, as well as the potential direction and relative scale of bias introduced by these assumptions.

**EXHIBIT 3-14. KEY ASSUMPTIONS OF THE ANALYSIS OF ECONOMIC IMPACTS TO LIVESTOCK GRAZING ACTIVITIES**

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
AUM reductions will only occur on allotments overlapping proposed critical habitat by greater than five percent.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> Land managers typically rely on alternative strategies for sage-grouse conservation on allotments with minor overlap with the proposed designation. These alternative strategies may result in impacts to ranchers, such as a loss of management flexibility.
The percentage of AUMs reduced on a given allotment is assumed to be equal to the percentage of the allotment overlapping proposed critical habitat.	May <b>overestimate</b> impacts.	<b>Probably minor.</b> Although the Service does not anticipate precluding grazing within the proposed designation, some allotments may face reductions in AUMs or other restrictions that affect a rancher's ability to graze cattle. Such restrictions are determined based on site-specific allotment conditions. Assuming reductions proportional to allotment acreage in critical habitat may overestimate impacts on some allotments, and may underestimate impacts on other allotments. Overall, impacts are likely overestimated, since the Service does not expect critical habitat designation to preclude grazing.
The livestock grazing permit value, in perpetuity, is \$105 per AUM on BLM lands and \$96 per AUM on USFS lands.	<b>Unknown.</b> May overestimate or underestimate impacts.	<b>Probably minor.</b> This analysis applies an average value from existing economic literature estimating permit values. To the extent that this estimated value has changed in real terms over time, this analysis may overestimate or underestimate impacts.
For allotments where the number of permitted AUMs is unknown, this analysis calculates AUMs as equal to the average number of AUMs per acre for other allotments in that office.	<b>Unknown.</b> May overestimate or underestimate impacts.	<b>Probably minor.</b> To the extent that permitted AUMs on individual allotments vary from the average, this analysis may overestimate or underestimate AUM reductions.
Allotments that have had permits renewed, AUMs reduced, or management strategies re-evaluated since 2004 will not incur future AUM reductions for the sage-grouse.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> BLM and USFS have addressed sage-grouse conservation when considering allotment permit renewals in recent years. To the extent that allotments that have already faced management changes require further changes in the future, this analysis underestimates impacts.

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
Each BLM and USFS field office with grazing land in the proposed designation will participate in one programmatic consultation in 2013 for grazing activities.	May <b>overestimate</b> impacts.	<b>Probably minor.</b> Both BLM and USFS are in the process of developing a CCA for the Gunnison Basin population. Once the conference opinion is completed for the CCA, additional consultations for the three field offices overlapping the Gunnison Basin unit may not be necessary. This assumption affects only the forecast consultation rate.
The Ute Mountain Ute Tribe will participate in one formal consultation in 2013 for operations on Pinecrest Ranch.	<b>Unknown.</b> May overestimate or underestimate impacts.	<b>Probably minor.</b> Specific information on Tribal activities on Pinecrest Ranch and the existence of a Federal nexus for consultation was not available for this analysis. To the extent that no Federal nexus exists, or if a conservation plan covers projects and activities, costs are overestimated. To the extent that activities on the ranch will require more than one consultation, costs are underestimated. This assumption affects only the forecast consultation rate.

## CHAPTER 4 | POTENTIAL ECONOMIC IMPACTS TO AGRICULTURE AND WATER MANAGEMENT

129. This chapter considers the potential for impacts to agriculture and water management, including the irrigation and cultivation of crops such as wheat, beans, sunflowers, hay, and alfalfa. This chapter addresses both baseline impacts associated with the listing of the sage-grouse and incremental impacts that may result from the designation of critical habitat.
130. The chapter proceeds as follows: Section 4.1 discusses the scope and scale of agriculture and water management within the proposed designation. Section 4.2 describes existing baseline conservation efforts pertaining to agricultural activities, and section 4.3 discusses the possibility of additional incremental conservation efforts. Sections 4.4 and 4.5 present the estimation of baseline and incremental impacts, respectively. Section 4.6 summarizes the results of the analysis, and section 4.7 presents key uncertainties.

### 4.1 SCOPE AND SCALE OF AGRICULTURE AND WATER MANAGEMENT

131. Agricultural activities occur throughout the proposed designation, particularly on privately owned lands in the Monticello-Dove Creek unit. Most cultivation is for pasture and hay production, which may provide some benefit to the sage-grouse as a source of food or cover.<sup>77</sup> However, in recent decades, the rate of land conversion for agricultural uses has slowed or reversed in both Colorado and Utah.<sup>78</sup> In each county within the proposed designation, except Gunnison County, total harvested cropland has declined over the past 20 years.<sup>79</sup> A public comment submitted by Gunnison County suggests that “little if any new land is being converted to agriculture” in that county as well.<sup>80</sup> Exhibit 4-1 highlights pasture and hay cultivation throughout the proposed designation, according to 2006 data from the National Land Cover Data Set.<sup>81</sup>

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<sup>77</sup> Ponish, Matthew T. Public comment submitted on behalf of the FSA Conservation and Environmental Programs Division on March 11, 2013. (2)

<sup>78</sup> *Ibid.* (1)

<sup>79</sup> *Ibid.* (2)

<sup>80</sup> Swenson, Paula, Phil Chamberland, Jonathan Houck. Public comment submitted on behalf of the Board of County Commissioners of the County of Gunnison, Colorado, on April 2, 2013. (91)

<sup>81</sup> U.S. Geological Survey. National Land Cover Database 2006 (NLCD2006). Downloaded from: [www.mrlc.gov/finddata.php](http://www.mrlc.gov/finddata.php) on April 24, 2013.

132. Other crops are also grown across the proposed designation. In particular, private farms in Dolores County grow several types of beans and sunflowers in addition to alfalfa hay.<sup>82</sup> Both San Juan County in Utah and Dolores County in Colorado have expressed concern that potential restrictions on agricultural activities associated with the proposed designation would significantly affect local economic development due to the dependence of those counties on agricultural revenue.<sup>83</sup>
133. Across the proposed designation, many privately owned farms participate in voluntary conservation-based programs with NRCS or FSA. As a result, these farmers would have a Federal nexus for section 7 consultation following the designation of critical habitat. FSA notes that approximately 57,300 acres within the occupied range of the sage-grouse are currently enrolled in its Conservation Reserve Program (CRP). The largest portion of these acres is within the Monticello-Dove Creek unit.
134. In addition, many of these farms rely on water supplied by local water conservation districts. Although several public comments note that irrigation may benefit the sage-grouse by promoting cultivation of sagebrush habitat, construction and maintenance of these water projects may be affected by the designation of critical habitat if a permit is required from the Corps.<sup>84</sup> Under section 404 of the CWA, permits are required when an activity results in the discharge of dredged or fill material into the waters of the United States.<sup>85</sup> As a result, we assume that irrigation projects may have a Federal nexus for section 7 consultation following the designation of critical habitat if these projects involve damming or diverting streams.

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<sup>82</sup> Stowe, Douglas R., Julie R. Kibel, Ernest R. Williams. Public comment submitted on behalf of the Dolores County Board of County Commissioners on March 27, 2013.

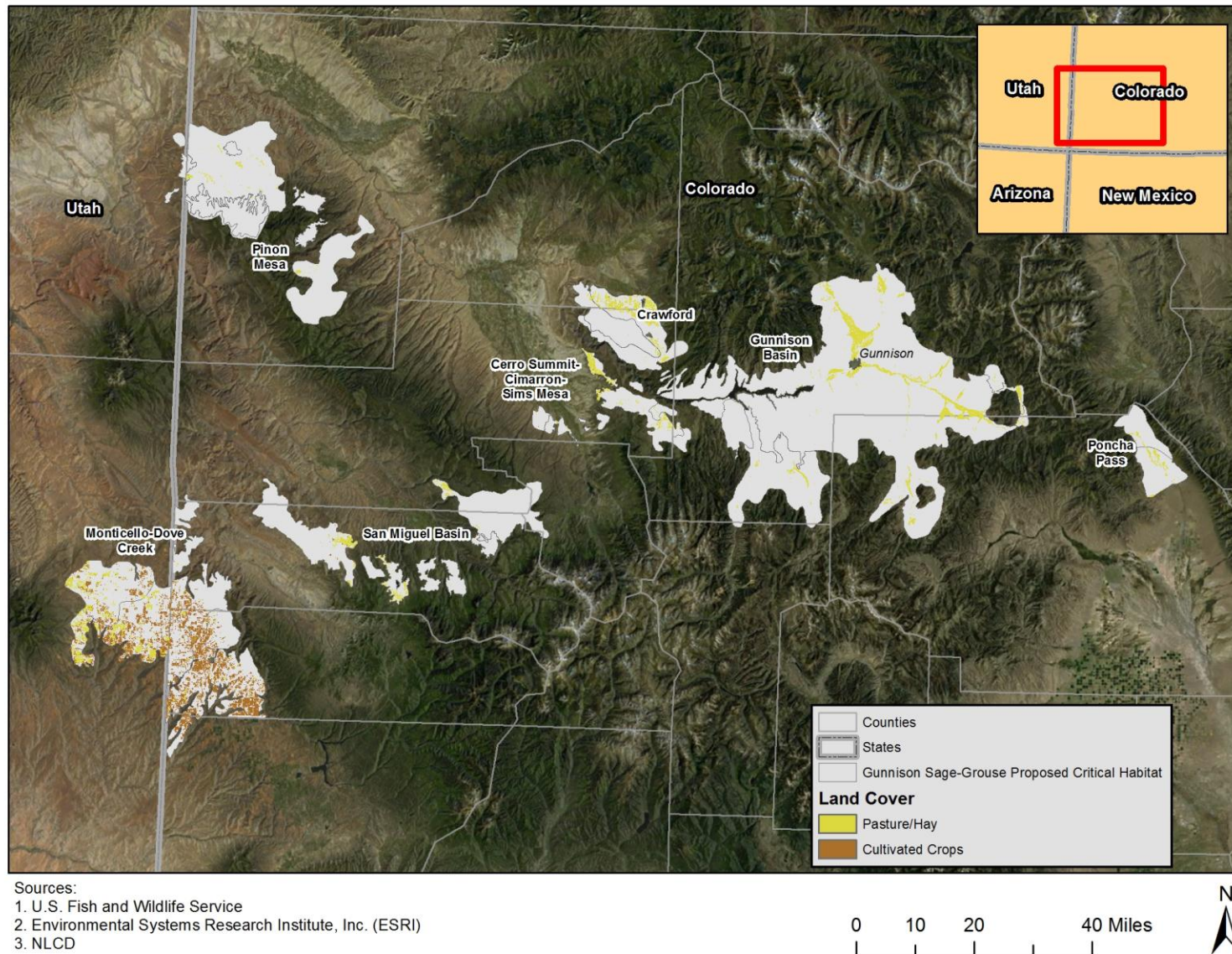
<sup>83</sup> Maryboy, Kenneth. Public comment submitted on behalf of the San Juan County Commission on April 1, 2013; and Stowe, Douglas R., Julie R. Kibel, Ernest R. Williams. Public comment submitted on behalf of the Dolores County Board of County Commissioners on March 27, 2013.

<sup>84</sup> See, for example: Swenson, Paula, Phil Chamberland, Jonathan Houck. Public comment submitted on behalf of the Board of County Commissioners of the County of Gunnison, Colorado, on April 2, 2013. (91)

<sup>85</sup> U.S. Environmental Protection Agency. Clean Water Act, Section 404. Website <http://water.epa.gov/lawsregs/guidance/wetlands/sec404.cfm>. Accessed on May 10, 2013.



EXHIBIT 4-1. AGRICULTURAL LANDS WITHIN PROPOSED DESIGNATION



#### 4.2 EXISTING BASELINE CONSERVATION EFFORTS

135. As described above, a significant number of acres within the proposed designation are enrolled in Federal conservation programs through NRCS and FSA. Both of these agencies require private participants to implement baseline conservation efforts for the sage-grouse and its habitat. These conservation efforts are described below.

##### 4.2.1 NRCS SAGE-GROUSE INITIATIVE

136. NRCS leads the Sage-grouse Initiative (SGI) to promote conservation of the greater sage-grouse and the Gunnison sage-grouse on privately owned lands in several states. This program includes the portions of Colorado and Utah proposed as critical habitat. Conservation practices fall into several categories: management, vegetative, structural, and limited use. Practices are intended to combat threats to the species and their habitat, including exotic species invasion, expansion of conifers, habitat fragmentation, lowering of the water table, and operation of unsustainable grazing systems.<sup>86</sup> Exhibit 4-2 presents examples of specific conservation practices implemented under the SGI.

#### EXHIBIT 4-2. NRCS SGI CONSERVATION PRACTICES

CATEGORY	DESCRIPTION
Management	Management practices adopt a “systems approach” and consider large-scale planning goals related to the sage-grouse and its habitat. These practices include provision of sage-grouse shelter, cover, and food in upland habitats; creation of site-specific grazing plans to enhance the sustainability of plant communities in sage-grouse habitat; and adopting timing guidelines for the removal of forage crops to optimize forage availability.
Vegetative	Vegetative conservation practices are those related specifically to management of vegetation. Practices include removal of conifers to enhance shrub and grassland habitat; removal of plant debris after forest slash treatments to promote regrowth; establishment of firebreaks to reduce threat of wildfire; establishment of plant covers that will prevent soil erosion; and cultivation of pasture and hay to reduce livestock demands on sage-grouse habitat.
Structural	Structural practices are those that involve structural changes or improvements intended to benefit the sage-grouse. Many of these practices are intended to facilitate improved livestock grazing management so as to protect sage-grouse habitat. Such practices include the construction of watering facilities; spring development; and drilling of wells. Other structural practices include construction of fences and the closure of roads in order to lessen human disturbance to sage-grouse habitat.
Limited Use	Practices that are applicable only in specific situations. These limited use practices include the creation of windbreaks; establishment of access roads to provide a fixed route for vehicular travel; and implementation of certain types of irrigation systems.
Sources: U.S. Fish and Wildlife Service. 2010. Conference Report for the Natural Resources Conservation Service Sage-grouse Initiative (SGI). July 30, 2010; and U.S. Fish and Wildlife Service Western Colorado Field Office. Biologist. Personal communication on March 22, 2013.	

<sup>86</sup> U.S. Fish and Wildlife Service. 2010. Conference Report for the Natural Resources Conservation Service Sage-grouse Initiative (SGI). July 30, 2010.



#### 4.2.2 FSA CONSERVATION RESERVE PROGRAM

137. The CRP, which is implemented by FSA, promotes the conversion of environmentally sensitive land to “long-term conservation covers,” such as grasses and trees.<sup>87</sup> Objectives of this program include reduction of soil erosion, protection of water resources, and enhancement of wildlife habitat. The sage-grouse is specifically addressed by the CRP State Acres for Wildlife Enhancement initiative. This initiative prioritizes conversion of cropland to grasses, shrubs, and forbs in an effort to restore and reconnect sage-grouse habitat.
138. As part of the CRP, FSA offers landowners financial incentives and technical support to implement conservation practices. FSA determines eligibility for inclusion in the program by evaluating numerous characteristics of the land, including the potential magnitude of benefits to sage-grouse habitat. Approximately 57,300 acres of CRP land are located within the occupied range of the Gunnison sage-grouse, as defined in the Gunnison Sage Grouse Range-wide Conservation Plan.<sup>88</sup>

#### 4.2.3 CUNNINGHAM LAKE RESERVOIR AND MILLER RANCH

139. Cunningham Lake Reservoir, located within the Gunnison National Forest northwest of the City of Gunnison, supplies water to Miller Ranch, which is owned by CPW for the preservation of sage-grouse habitat. The Reservoir is within the occupied portion of the proposed Gunnison Basin unit and is currently in disrepair. The Upper Gunnison River Water Conservancy District (WCD) is currently developing a project to restore the Reservoir in order to maintain irrigation of Miller Ranch and the associated sage-grouse habitat. Through public comment, the Upper Gunnison River WCD expressed concern that the designation may hinder this project.<sup>89</sup>

#### 4.3 POTENTIAL INCREMENTAL CONSERVATION EFFORTS

140. Based on conversations with NRCS and FSA, we do not forecast any changes to the conservation practices implemented by these agencies following the listing of the species or the designation of critical habitat. Both agencies already consider impacts to the sage-grouse and its habitat throughout the area proposed for designation.<sup>90</sup> As a result, this analysis forecasts only administrative impacts associated with agricultural activities on privately owned lands.
141. This analysis also considers the potential for incremental conservation efforts associated with irrigation projects that support regional agriculture. Based on information submitted by the Upper Gunnison River WCD, Dolores WCD, and Southwestern Water

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<sup>87</sup> Ponish, Matthew T. Public comment submitted on behalf of the FSA Conservation and Environmental Programs Division on March 11, 2013.

<sup>88</sup> *Ibid.*

<sup>89</sup> Clow, John H., General Counsel. Public comment submitted on behalf of Upper Gunnison River Water Conservancy District on April 2, 2013.

<sup>90</sup> Bingham, K. FSA Colorado State Office. Personal communication on May 2, 2013; Backhaus, G. State Resource Conservationist, NRCS Colorado State Office. Personal communication on April 30, 2013; Boeke, E. NRCS Utah State Office. Personal communication on May 1, 2013; and Jones, L. FSA Utah State Office. Personal communication on May 3, 2013.

Conservation District in response to the Proposed Rule, we consider impacts to a single ongoing project within the proposed designation. Because this project, the Cunningham Lake Reservoir, is intended to support the creation and maintenance of sage-grouse habitat on Miller Ranch, we do not forecast any additional conservation efforts associated with this project.<sup>91</sup>

#### 4.4 BASELINE IMPACTS

142. Because agricultural activities within the proposed designation are located primarily on privately owned land, this analysis assumes that the relevant Federal nexus for agricultural activities is participation in NRCS or FSA programs. Based on information provided by the Service and communication with NRCS and FSA, we assume that consultation will occur on a programmatic level for each agency.<sup>92</sup> Consultation between NRCS and the Service is currently underway, and is expected to be complete prior to critical habitat designation. This consultation is intended to minimize any regulatory or economic burden resulting from the species listing and critical habitat designation, and to provide regulatory assurance and coverage under the Act for enrolled landowners.<sup>93</sup> Our analysis forecasts a single consultation for NRCS to consider jeopardy to the sage-grouse and adverse modification of critical habitat associated with the conservation practices of the multi-state SGI. Similarly, we forecast a single programmatic consultation for FSA to consider the potential for jeopardy or adverse modification resulting from its programs, such as the CRP, in both Colorado and Utah. We assume that each of these consultations will occur in 2013.
143. We also forecast one formal consultation in 2013 associated with rehabilitation of the Cunningham Lake Reservoir. This project will involve the Upper Gunnison River WCD and is likely to require a section 404 CWA permit from the Corps. According to maps provided by the Upper Gunnison River WCD, this project is located in the occupied portion of the Gunnison Basin unit.<sup>94</sup>
144. Baseline impacts include the portion of administrative effort to consider jeopardy to the species in each consultation. Therefore, we expect baseline impacts of the designation to be limited to the administrative cost of the two forecast programmatic consultations and one formal consultation. Baseline impacts are estimated to be \$69,000 present value, discounted at seven percent. Annualized over the 20-year analysis period, these impacts are \$6,100.

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<sup>91</sup> Clow, John H., General Counsel. Public comment submitted on behalf of Upper Gunnison River Water Conservancy District on April 2, 2013.

<sup>92</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013; Boeke, E. NRCS Utah State Office. Personal communication on May 1, 2013; and Backhaus, G. NRCS Colorado State Office. Personal communication on April 30, 2013.

<sup>93</sup> U.S. Fish and Wildlife Service. Personal communication on June 21, 2013.

<sup>94</sup> Clow, John H., General Counsel. Public comment submitted on behalf of Upper Gunnison River Water Conservancy District on April 2, 2013.

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**4.5 INCREMENTAL IMPACTS**

145. As described in section 4.3, we do not anticipate that the Service will recommend additional conservation efforts to avoid adverse modification of critical habitat for NRCS or FSA programs, or for Cunningham Lake Reservoir rehabilitation. Therefore, incremental impacts related to agriculture are limited to the portion of administrative costs to consider adverse modification of critical habitat in two programmatic consultations and one formal consultation. Across all units, present value incremental impacts to agricultural and water management activities are estimated to be \$23,000, discounted at seven percent. Annualized, these impacts are \$2,000.
146. In addition to the costs associated with section 7 consultations, we consider the potential for non-section 7 impacts resulting from regulatory uncertainty or stigma. Several stakeholders have expressed concern that landowners within the designation may decide not to participate in NRCS or FSA programs in order to avoid the Federal nexus for agricultural activities on privately owned lands. According to public comment, FSA has received feedback from current CRP participants suggesting that, without “exemptions and sufficient assurances that the approved conservation practices installed today are not likely to jeopardize their ability to make a living off their land tomorrow,” private landowners may not participate in voluntary conservation programs. These landowners hope to avoid potential land use restrictions that may result from the creation of wildlife habitat on their lands.<sup>95</sup>
147. The FSA Utah State Office confirmed this concern and suggested that up to 20 percent of current CRP participants might not re-enroll due to the designation of critical habitat.<sup>96</sup> The FSA Colorado State Office was similarly concerned that the designation could have a significant effect on participation in FSA programs.<sup>97</sup>
148. The NRCS Colorado State Office recognized the possibility that withdrawal from their programs could occur as a result of the designation. However, NRCS expects the withdrawal rate to be minimal. NRCS suggests that at most five percent of current participants might not re-enroll, basing this assertion on the fact that the designation is not expected to result in additional conservation practices.<sup>98</sup>
149. This analysis acknowledges the possibility that some farmers may withdraw applications for these programs following the designation of critical habitat. While such actions could result in reduced income for these farmers, NRCS and FSA funds would likely be reallocated elsewhere in the region. Additionally, at this time we are unable to predict the likelihood that applications will be withdrawn. As a result, we do not quantify impacts associated with withdrawals from voluntary conservation programs.

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<sup>95</sup> Ponish, Matthew T. Public comment submitted on behalf of the FSA Conservation and Environmental Programs Division on March 11, 2013.

<sup>96</sup> Jones, L. FSA Utah State Office. Personal communication on May 3, 2013.

<sup>97</sup> Bingham, K. FSA Colorado State Office. Personal communication on May 2, 2013.

<sup>98</sup> Backhaus, G. State Resource Conservationist, NRCS Colorado State Office. Personal communication on April 30, 2013.

**4.6 SUMMARY OF RESULTS**

150. This analysis forecasts baseline impacts associated with agricultural activities of \$69,000 (present value over 20 years) and incremental impacts of \$23,000 (present value over 20 years). These impacts are associated with two programmatic section 7 consultations to address sage-grouse conservation in NRCS and FSA programs, and one formal section 7 consultation for rehabilitation of the Cunningham Lake Reservoir. Exhibit 4-3 and 4-4 summarize the results of the analysis of impacts to agricultural and water management activities.

**EXHIBIT 4-3. FORECAST BASELINE IMPACTS TO AGRICULTURAL AND WATER MANAGEMENT ACTIVITIES, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$19,000	\$1,700
Piñon Mesa	\$5,900	\$520
San Miguel Basin	\$6,100	\$540
Cerro Summit-Cimarron-Sims Mesa	\$3,100	\$270
Crawford	\$3,400	\$300
Gunnison Basin	\$30,000	\$2,700
Poncha Pass	\$1,000	\$90
<b>Total</b>	<b>\$69,000</b>	<b>\$6,100</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT 4-4. FORECAST INCREMENTAL IMPACTS TO AGRICULTURAL AND WATER MANAGEMENT ACTIVITIES, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$6,500	\$570
Piñon Mesa	\$2,000	\$170
San Miguel Basin	\$2,000	\$180
Cerro Summit-Cimarron-Sims Mesa	\$1,000	\$92
Crawford	\$1,100	\$100
Gunnison Basin	\$10,000	\$890
Poncha Pass	\$340	\$30
<b>Total</b>	<b>\$23,000</b>	<b>\$2,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

#### 4.7 KEY UNCERTAINTIES

151. Exhibit 4-5 summarizes the key assumptions in our analysis of potential economic impacts related to agricultural and water management activities, as well as the potential direction and relative scale of bias introduced by these assumptions.

**EXHIBIT 4-5. KEY ASSUMPTIONS OF THE ANALYSIS OF ECONOMIC IMPACTS TO AGRICULTURAL AND WATER MANAGEMENT ACTIVITIES**

ASSUMPTION/ SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
All FSA and NRCS programs will be addressed in one multi-state programmatic consultation for each agency.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> This assumption affects only the forecast consultation rate. Communication with both agencies suggests that NRCS and FSA anticipate addressing all programs in a single consultation. These consultations are expected to be completed prior to the listing of the species and designation of critical habitat.
The Service will not recommend additional conservation efforts beyond those already implemented by NRCS and FSA.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> Neither NRCS nor FSA anticipates a need for additional conservation efforts. To the extent that additional conservation efforts are requested, some participating landowners may incur additional costs.
Rehabilitation of the Cunningham Lake Reservoir will require formal section 7 consultation in 2013.	May <b>overestimate</b> impacts.	<b>Probably minor.</b> This assumption affects only the forecast consultation rate. Because this project involves water supply from the Mill Creek drainage, we assume that a permit from the Corps will be required.
The Service will not recommend additional conservation efforts for rehabilitation of the Cunningham Lake Reservoir.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> This project is intended to improve sage-grouse conservation. To the extent that additional conservation efforts are requested, the water conservancy district may incur additional costs.
Additional irrigation projects will not require section 7 consultation during the analytical timeframe.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> Irrigation projects will only require consultation if a Federal nexus, such as a permit from the Corps, is present. We are not aware of any additional planned or ongoing projects.

## CHAPTER 5 | POTENTIAL ECONOMIC IMPACTS TO MINERAL AND FOSSIL FUEL EXTRACTION

152. This chapter considers the potential for impacts to mineral and fossil fuel extraction, including oil and gas operations, uranium mining, and potash mining associated with the proposed designation. This chapter addresses existing conservation efforts and the baseline and incremental impacts that may result from sage-grouse conservation. The chapter proceeds as follows: Section 5.1 provides background on mineral and fossil fuel extraction activities within the proposed designation, and section 5.2 describes existing baseline conservation efforts. Section 5.3 discusses the types of additional conservation efforts that may be requested following the designation of critical habitat. Section 5.4 presents our analytical approach and estimation of baseline impacts, and section 5.5 presents the estimation of incremental impacts. Section 5.6 summarizes overall results. Section 5.7 concludes with a discussion of key uncertainties.

### 5.1 SCOPE AND SCALE OF MINERAL AND FOSSIL FUEL EXTRACTION

153. The proposed Monticello-Dove Creek and San Miguel Basin units support numerous mineral and fossil fuel extraction activities. In particular, these units are located within the Paradox Basin, a major oil and gas producing region, and the Uravan Mineral Belt, which has historically been the most productive region in Colorado for uranium mining.<sup>99</sup> In addition, potash mining is planned for areas within the proposed designation. The following sections provide background information on each of these activities.

#### 5.1.1 OIL AND GAS DEVELOPMENT

154. National trends suggest that natural gas production is likely to increase for several decades, and oil production will increase through approximately 2020.<sup>100</sup> However, the portion of the Paradox Basin that is proposed for critical habitat designation experiences relatively low levels of production compared to other regions. The Bureau of Economic and Business Research at the University of Utah notes that the Paradox Basin is the “oldest and second-largest source of crude oil in Utah.” However, both oil and natural gas production in San Juan County have been in decline since the late 1980s.<sup>101</sup> The Colorado Energy Research Institute notes that although the “Paradox Basin is an important oil producing region [...], most of the basin’s production exists outside of

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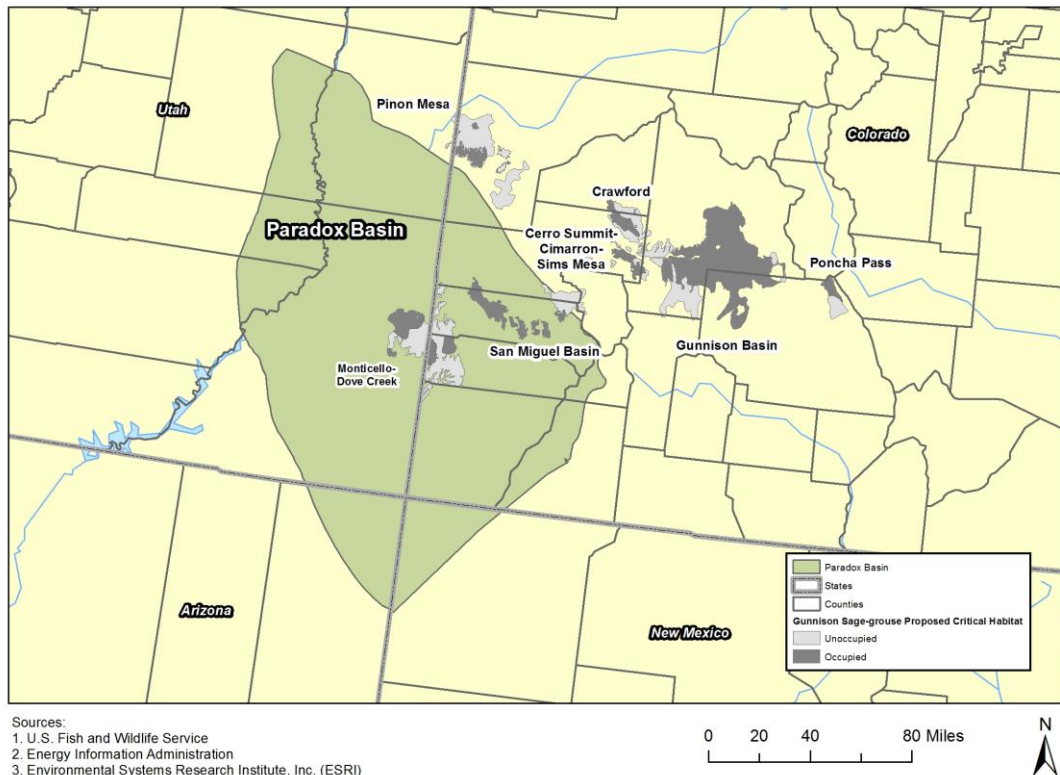
<sup>99</sup> Colorado Division of Reclamation, Mining & Safety. Uranium Mining in Colorado 2013. Accessed at [mining.state.co.us/SiteCollectionDocuments/UraniumMining.pdf](http://mining.state.co.us/SiteCollectionDocuments/UraniumMining.pdf) on May 2, 2013.

<sup>100</sup> U.S. Energy Information Administration. Annual Energy Outlook 2013 with Projections to 2040. April 2013.

<sup>101</sup> Bureau of Economic and Business Research. David Eccles School of Business, University of Utah. The Structure and Economic Impact of Utah’s Oil and Gas Exploration and Production Industry. July 2009. (21)

Colorado.”<sup>102</sup> Exhibit 5-1 shows the location of the proposed designation within the Paradox basin.

**EXHIBIT 5-1. PROPOSED CRITICAL HABITAT AND THE PARADOX BASIN**

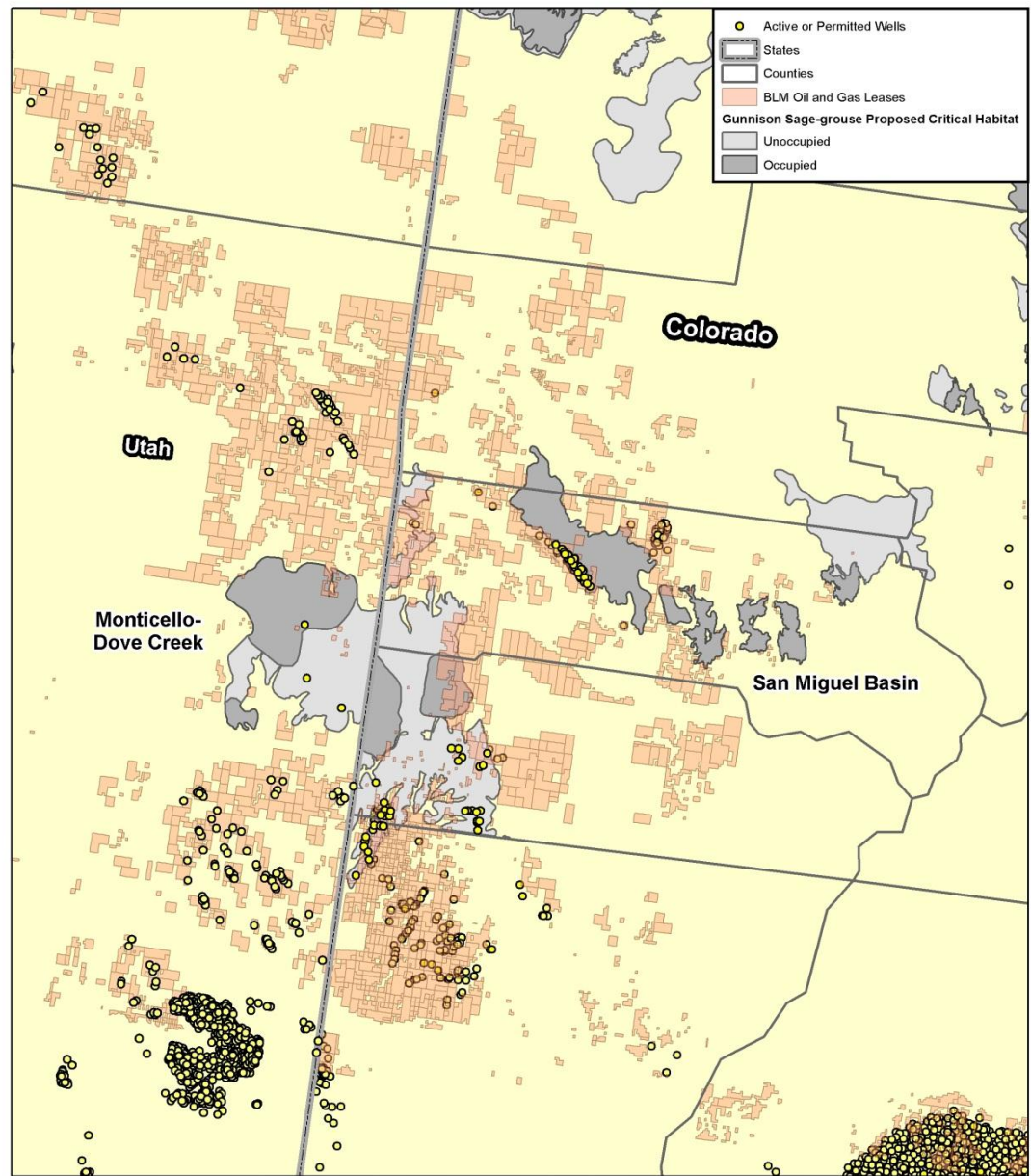


155. Information from BLM also suggests that oil and gas activity within the proposed designation may be low compared to areas outside of critical habitat. Exhibit 5-2 shows the location of all BLM oil and gas leases, as well as well sites according to the Colorado Oil and Gas Conservation Commission (COGCC) and the Utah Division of Oil, Gas and Mining. This map indicates that activity levels are highest outside the boundaries of the proposed designation.

<sup>102</sup> Colorado Energy Research Institute. Colorado School of Mines. Oil and Gas Economic Impact Analysis. June 2007. (20)



## EXHIBIT 5-2. OIL AND GAS LEASES AND WELL SITES PROXIMATE TO PROPOSED CRITICAL HABITAT



## Sources:

1. U.S. Fish and Wildlife Service
2. Bureau of Land Management
3. Colorado Oil & Gas Conservation Commission
4. Utah Department of Natural Resources -  
Division of Oil, Gas and Mining
5. Environmental Systems Research Institute, Inc. (ESRI)

156. Of the approximately 54,000 acres leased by BLM within proposed critical habitat in Colorado, 21,000 (38 percent) are currently in production.<sup>103</sup> Within proposed critical habitat in Utah, none of the leased acres are currently producing, as shown in Exhibit 5-3.<sup>104</sup> Operators may choose to begin producing in the future. Oil and gas leases are issued for ten years, after which they may only be extended if the well is in production.<sup>105</sup> According to information from the Utah Office of the Governor, the portion of proposed critical habitat in Utah is located within an area identified as having high potential for exploration and development.<sup>106</sup> As a result, this analysis assumes that future oil and gas activity is likely to occur within proposed critical habitat.

**EXHIBIT 5-3. LEASED AND PRODUCING ACRES ON BLM LAND WITHIN PROPOSED CRITICAL HABITAT**

UNIT	OCCUPANCY	COLORADO		UTAH		TOTAL	
		LEASED ACRES	PRODUCING ACRES	LEASED ACRES	PRODUCING ACRES	LEASED ACRES	PRODUCING ACRES
Monticello-Dove Creek	Occupied	11,000	0	2,000	0	13,000	0
	Unoccupied	35,000	16,000	660	0	36,000	16,000
San Miguel Basin	Occupied	8,000	5,000	n/a	n/a	8,000	5,000
	Unoccupied	40	0	n/a	n/a	40	0
<b>Total</b>		<b>54,000</b>	<b>21,000</b>	<b>2,700</b>	<b>0</b>	<b>57,000</b>	<b>21,000</b>

157. Oil and gas extraction occurs on both Federal and private lands within the proposed designation. Exhibit 5-4 shows active, producing, and permitted well sites within the Monticello-Dove Creek and San Miguel Basin units. Two of these sites are located in the unoccupied portion of the Monticello-Dove Creek unit in Utah, and one is located in the occupied portion. None involve Federal leases.<sup>107</sup> In Colorado, there are five newly permitted well sites on non-Federal land in the occupied portion of the Monticello-Dove Creek unit. Additionally, 29 active or producing well sites are located within the unoccupied portion of the Monticello-Dove Creek unit, and 38 are located within the

<sup>103</sup> Estimates from BLM Colorado and GIS analysis differ slightly. For example, BLM estimates that just over 18,000 acres are leased in occupied habitat in Colorado. According to our analysis of GIS data from BLM and the Service, this number is nearly 18,700 acres. BLM did not estimate leased acres in unoccupied habitat or within the State of Utah. To maintain consistency throughout this analysis, we rely on GIS estimates, acknowledging that there may be some variability in calculated areas. (Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 8, 2013.)

<sup>104</sup> Utah Bureau of Land Management. GIS data for oil and gas leases accessed at: [http://www.blm.gov/ut/st/en/prog/more/geographic\\_information/gis\\_data\\_and\\_maps.html](http://www.blm.gov/ut/st/en/prog/more/geographic_information/gis_data_and_maps.html) on April 24, 2013.

<sup>105</sup> Colorado Bureau of Land Management Oil & Gas Leasing Instructions. Accessed at [http://www.blm.gov/co/st/en/BLM\\_Programs/oilandgas/CO\\_leasing\\_information.html](http://www.blm.gov/co/st/en/BLM_Programs/oilandgas/CO_leasing_information.html) on May 15, 2013.

<sup>106</sup> Clarke, Kathleen. Director, Utah Office of the Governor Public Lands Policy Coordination. Public comment submitted on April 2, 2013.

<sup>107</sup> Utah Division of Oil, Gas and Mining. Department of Natural Resources. GIS data for oil and gas wells accessed at: <http://gis.utah.gov/data/energy/oil-gas/> on April 24, 2013.

occupied portion of the San Miguel Basin unit. All are located on BLM land except 10 wells in the Monticello-Dove Creek unit.<sup>108</sup>

158. Mineral and fossil fuel extraction activities on privately owned lands without Federal mineral rights are unlikely to have a Federal nexus for section 7 consultation. These sites typically only require permits from county planning authorities.<sup>109</sup> We therefore limit our analysis of impacts to operations leased by BLM, which manages land in both the Monticello-Dove Creek and San Miguel Basin units.

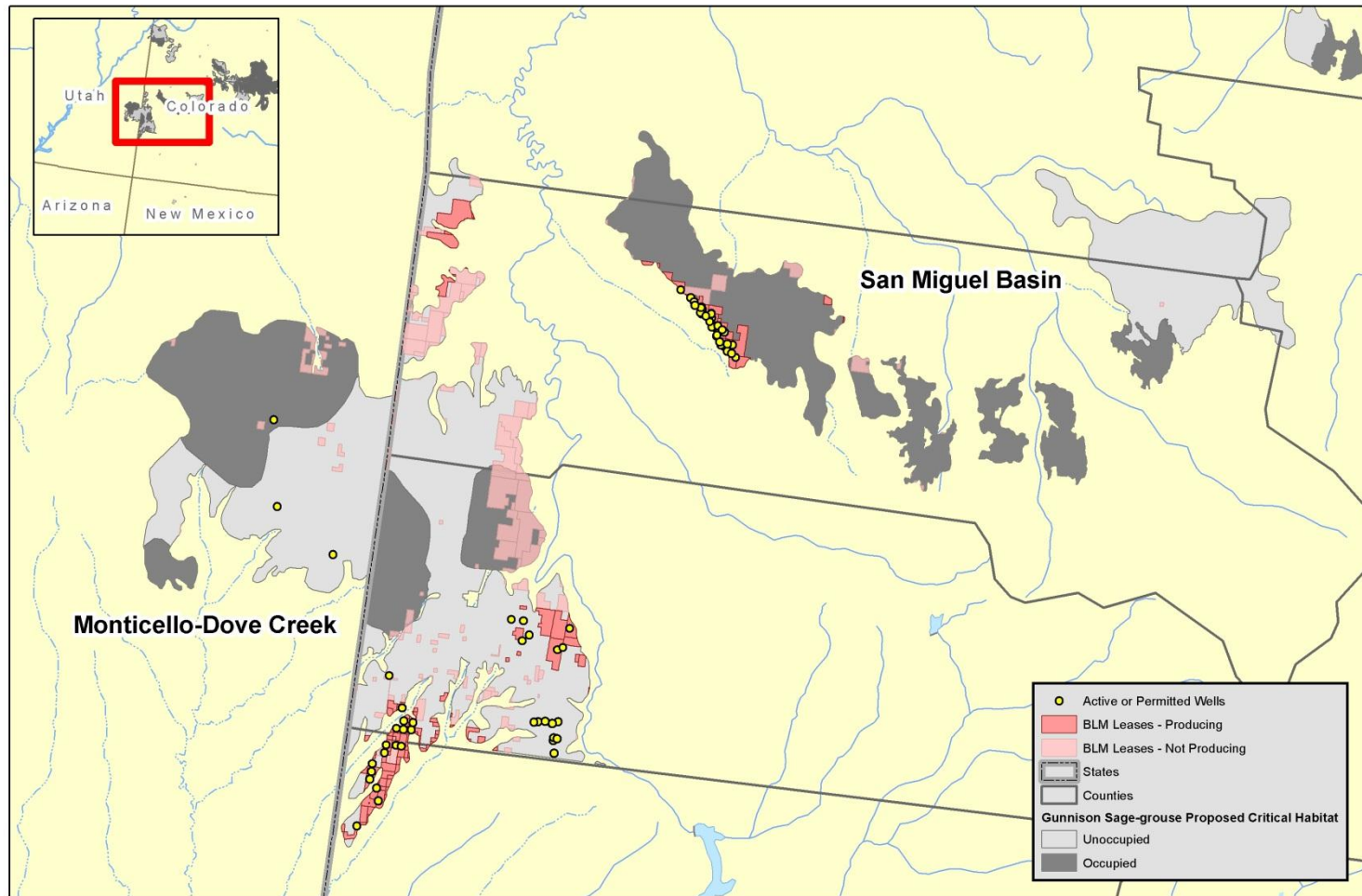
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<sup>108</sup> Colorado Oil and Gas Conservation Commission. GIS Downloads. GIS data for well surface locations and oil and gas permit locations accessed at: <http://cogcc.state.co.us/> on March 5, 2013.

<sup>109</sup> Fernandez, Dan. Vice Chair, Dolores County Development Corporation. Personal communication on April 26, 2013.

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EXHIBIT 5-4. OVERVIEW OF OIL AND GAS ACTIVITY WITHIN PROPOSED CRITICAL HABITAT



## Sources:

1. U.S. Fish and Wildlife Service
2. Bureau of Land Management
3. Colorado Oil & Gas Conservation Commission
4. Utah Department of Natural Resources - Division of Oil, Gas and Mining
5. Environmental Systems Research Institute, Inc. (ESRI)

0 5 10 20 Miles



### 5.1.2 URANIUM MINING

159. In addition to oil and gas extraction, this analysis also considers uranium mining. As described above, the Uravan Mineral Belt has historically been the source of significant uranium production. Colorado ranks third among all states for uranium reserves.<sup>110</sup> Public comments submitted by both Montrose and San Miguel Counties express concern that the designation of critical habitat may affect future uranium mining activity, which is managed through the U.S. Department of Energy's (DOE) Uranium Leasing Program.<sup>111</sup> DOE is currently in the process of evaluating alternatives for all remaining leases. The Draft Programmatic Environmental Impact Statement identifies extension of these leases for a 10-year period as the preferred alternative.<sup>112</sup>
160. In recent years, uranium mining activity in this area has nearly ceased due to a large drop in global uranium prices. Uranium prices dropped from a peak of \$136 per pound in 2007 to approximately \$40 per pound in 2013.<sup>113</sup> According to information from the Colorado Division of Reclamation, Mining & Safety, as well as public comments submitted on the Proposed Rule, there is one active status mine within proposed critical habitat.<sup>114</sup> This site is currently in a maintenance (i.e., not producing) phase.<sup>115</sup> Construction of the first conventional uranium mill in 25 years - the Piñon Ridge Uranium Mill - is anticipated to occur near, but outside, the occupied portion of the San Miguel Basin unit. However, local news articles suggest that this mill may not be built until uranium prices increase.<sup>116</sup> Although uranium mining activity may occur in the future within the proposed designation, we are unable to predict when and to what extent such activity might resume. As a result, we do not forecast any impacts associated with sage-grouse conservation. If uranium mining does occur in the next 20 years, this assumption likely underestimates impacts to operations with DOE leases.

<sup>110</sup> Colorado Division of Reclamation, Mining & Safety. Uranium Mining in Colorado 2013. Accessed at [mining.state.co.us/SiteCollectionDocuments/UraniumMining.pdf](http://mining.state.co.us/SiteCollectionDocuments/UraniumMining.pdf) on May 2, 2013.

<sup>111</sup> Montrose County Board of County Commissioners. Public Comment on the Proposed Designation of Critical Habitat for the Gunnison Sage-grouse. April 1, 2013; and San Miguel County Board of County Commissioners. Public Comment on the Proposed Designation of Critical Habitat for the Gunnison Sage-grouse. April 2, 2013.

<sup>112</sup> U.S. Department of Energy. Draft Uranium Leasing Program Programmatic Environmental Impact Statement. March 2013. Accessed at <http://ulpeis.anl.gov/> on May 15, 2013.

<sup>113</sup> Cameco. Uranium Spot Price History. Accessed at [http://www.cameco.com/investors/markets/uranium\\_price/spot\\_price\\_complete\\_history/](http://www.cameco.com/investors/markets/uranium_price/spot_price_complete_history/) on May 15, 2013.

<sup>114</sup> Colorado Division of Reclamation, Mining & Safety. Uranium Mining in Colorado 2013. Accessed at [mining.state.co.us/SiteCollectionDocuments/UraniumMining.pdf](http://mining.state.co.us/SiteCollectionDocuments/UraniumMining.pdf) on May 2, 2013; and Montrose County Board of County Commissioners. Public Comment on the Proposed Designation of Critical Habitat for the Gunnison Sage-grouse. April 1, 2013.

<sup>115</sup> Colorado Division of Reclamation, Mining & Safety. Uranium Mining in Colorado 2013. Accessed at [mining.state.co.us/SiteCollectionDocuments/UraniumMining.pdf](http://mining.state.co.us/SiteCollectionDocuments/UraniumMining.pdf) on May 2, 2013.

<sup>116</sup> See, for example: Sackett, Heather. "State grants license to Energy Fuels." Telluride Daily Planet. April 28, 2013. Accessed at <http://telluridenews.com/articles/2013/05/06/news/doc517b0422dd62f760154256.txt> on May 15, 2013.



### 5.1.3 POTASH MINING

161. Potash exploration is also planned for sage-grouse critical habitat. According to RM Potash, the company applied for 22 prospecting permits on approximately 40,000 acres of BLM land during 2009 and 2010. Currently, RM Potash is preparing an Environmental Analysis for six proof-of-concept drill sites within the unoccupied portion of the Monticello Dove-Creek unit. RM Potash estimates that between 250,000 and two million tons of potash may be recovered per year for at least 20 years.<sup>117</sup> If preliminary explorations determine that extraction is feasible, potash mining could become a significant economic activity in the future.

### 5.2 EXISTING BASELINE CONSERVATION EFFORTS

162. Mineral and fossil fuel extraction activities may threaten the sage-grouse by degrading or directly destroying habitat. However, existing Federal and state regulations provide some protection to the sage-grouse and its habitat. According to communication with the oil and gas industry, typical conservation efforts for the sage-grouse may include limiting traffic, noise control, and purchasing land set-asides.<sup>118</sup> Existing regulations may also require complete avoidance of surface disturbance within portions of sage-grouse habitat. These protections are summarized below.

#### 5.2.1 BLM RESOURCE MANAGEMENT PLANS

163. For extraction leases issued by BLM, the agency requires operators to adopt conservation efforts as specified in BLM RMPs. The seven BLM field offices overlapping the proposed designation – the Gunnison, Uncompahgre, San Juan/Tres Rios, San Luis Valley, and Grand Junction field offices in Colorado, and Moab and Monticello field offices in Utah – each have RMPs addressing sage-grouse conservation, to varying degrees, for mineral and fossil fuel extraction activities. The Uncompahgre, San Juan/Tres Rios, and Grand Junction field offices are currently revising their RMPs.<sup>119</sup> Exhibit 5-5 summarizes the conservation efforts and stipulations from these RMPs. Note that not all conservation efforts are included in each RMP.

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<sup>117</sup> Thorson, Jon P. Public comment submitted on behalf of RM Potash on March 5, 2013.

<sup>118</sup> Lopez, Chris. Regulatory Specialist, D.J. Simmons, Inc. Personal communication on April 25, 2013.

<sup>119</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 8, 2013.

**EXHIBIT 5-5. BLM BASELINE PROTECTIONS IN SAGE-GROUSE HABITAT**

CONSERVATION EFFORT	DESCRIPTION
Avoidance of surface disturbance	<ul style="list-style-type: none"> <li>• No Surface Occupancy or Controlled Surface Use stipulations within 0.6 miles of active leks.</li> <li>• Controlled Surface Use stipulation within 4 miles of active leks.</li> <li>• Additional stipulations for No Ground Disturbance, Controlled Surface Use, and Site-Specific Relocation in occupied habitat.</li> </ul>
Timing restrictions	<ul style="list-style-type: none"> <li>• Activity restrictions during sage-grouse breeding or nesting seasons in occupied habitat.</li> </ul>
Habitat restoration	<ul style="list-style-type: none"> <li>• Prioritize restoration of sagebrush grassland in unoccupied sage-grouse habitat.</li> </ul>
<b>Sources:</b> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 8, 2013; and Bureau of Land Management. Monticello Field Office. Record of Decision and Approved Resource Management Plan. November 2008.	

164. Additionally, according to information from the La Plata County Energy Council and other oil and gas industry groups, BLM has temporarily withheld oil and gas leases from sales throughout all occupied sage-grouse habitat in Colorado. Such lease deferrals have occurred since 2005 and may prevent development on these parcels for multiple years while BLM considers environmental impacts.<sup>120</sup> Deferring development of these sites may provide short-term protection to the sage-grouse and its habitat.

**5.2.2 COGCC REGULATIONS**

165. COGCC implements numerous environmental regulations that provide baseline protection to the sage-grouse and its habitat. These rules were amended most recently by the Colorado General Assembly in 2008.<sup>121</sup> COGCC regulations are intended for both Federal and private lands.<sup>122</sup> COGCC classifies all occupied sage-grouse habitat as Sensitive Wildlife Habitat. In addition, sage-grouse lek areas are designated as Restricted Surface Occupancy Areas.<sup>123</sup> As a result of these classifications, oil and gas operators are required to undertake specific conservation efforts that may benefit

<sup>120</sup> Zeller, Christi. Public comment submitted on behalf of La Plata County Energy Council on April 1, 2013; and Western Energy Alliance, Public Lands Advocacy, the Independent Petroleum Association of America, and the Colorado Oil & Gas Association. Public comment submitted on April 2, 2013. [Docket number FWS-R6-ES-2012-0108]

<sup>121</sup> Ranger, Richard. Public comment submitted on behalf of the American Petroleum Institute on April 2, 2013. [Docket number FWS-R6-ES-2012-0108]

<sup>122</sup> Colorado Oil and Gas Conservation Commission. Frequently Asked Questions: MOU Concerning Application of COGCC Rules On Federal Lands in Colorado.

<sup>123</sup> Colorado Oil and Gas Conservation Commission. Amended Rules, Appendix VII - Restricted Surface Occupancy Maps (Amended) and Appendix VIII - Sensitive Wildlife Habitat Maps. Accessed at <http://cogcc.state.co.us/> on May 15, 2013.



the sage-grouse. Exhibit 5-6 summarizes these conservation efforts. COGCC does not require these protections in unoccupied sage-grouse habitat.

**EXHIBIT 5-6. COGCC BASELINE PROTECTIONS IN SAGE-GROUSE HABITAT**

LOCATION	BASELINE PROTECTIONS
Sensitive Wildlife Habitat (includes all occupied sage-grouse habitat)	<ul style="list-style-type: none"> <li>• Consult with CPW to evaluate options for minimizing adverse habitat impacts;</li> <li>• Educate employees and contractors on conservation practices;</li> <li>• Consolidate new facilities to minimize disturbance;</li> <li>• Control road access and limit traffic; and</li> <li>• Monitor wells remotely when possible.</li> </ul>
Restricted Surface Occupancy Area (surrounds sage-grouse leks)	<ul style="list-style-type: none"> <li>• Comply with all requirements for Sensitive Wildlife Habitat; and</li> <li>• Avoid all new ground-disturbing activities.</li> </ul>
<b>Source:</b> Colorado Oil and Gas Conservation Commission. 1200 Series Protection of Wildlife Resources. Accessed at <a href="http://cogcc.state.co.us/">http://cogcc.state.co.us/</a> on May 15, 2013.	

**5.3 POTENTIAL INCREMENTAL CONSERVATION EFFORTS**

166. Several public comments received in response to the Proposed Rule express concern about impacts to the oil and gas industry, and other mineral extraction activities, if critical habitat is designated. In particular, these comments note that the industry could incur significant costs if the Service requests additional conservation efforts, such as:

- No Surface Occupancy stipulations;
- Spatial and seasonal buffers;
- Compensatory mitigation (land set-asides); and
- Changes to facility siting and design.<sup>124</sup>

As described above, these types of conservation efforts are, in many cases, already requested in portions of occupied habitat in the baseline. Following the designation of critical habitat, some of these conservation efforts may also be requested in unoccupied habitat.

167. As described in Chapter 2, the Service does not anticipate requesting different conservation efforts to avoid adverse modification of critical habitat beyond those that would be requested to avoid jeopardy to the species, except in cases where a project will result in significant alteration of habitat. Oil and gas activities do not typically disturb large areas of surface habitat. For example, according to Colorado BLM, well pads in the area proposed as critical habitat range in size from one acre to

<sup>124</sup> Zeller, Christi. Public comment submitted on behalf of La Plata County Energy Council on April 1, 2013; and Lopez, Chris S. Public comment submitted on behalf of D.J. Simmons, Inc. on April 2, 2013.

five acres.<sup>125</sup> Representatives of Dolores County confirmed that oil and gas extraction activities disturb only a small portion of leased area.<sup>126</sup> However, cumulative disturbance from oil and gas field development may result in significant alteration of habitat on a landscape scale, in which case additional conservation efforts may be necessary.<sup>127</sup> Because data are not available to predict the specific locations of future oil and gas well pad construction, we cannot predict the probability that cumulative oil and gas development will result in significant alteration of habitat. As a result, we do not forecast additional conservation efforts for individual projects. Instead, as described below, we consider distributional impacts associated with the reduction in regional oil and gas activity that may occur if companies consider section 7 consultation and associated conservation efforts to be too costly.

#### 5.4 BASELINE IMPACTS

168. Because extraction operations on privately owned lands are unlikely to have a Federal nexus for section 7 consultation except where Federal mineral ownership occurs, we limit our analysis to operations leased by BLM in the Monticello-Dove Creek and San Miguel Basin units. This analysis assumes that baseline impacts to mineral and fossil fuel extraction occur in occupied portions of the Monticello-Dove Creek and San Miguel Basin units. We consider both costs associated with section 7 consultation and non-section 7 impacts resulting from companies' desire to avoid potential regulatory burden.

##### 5.4.1 ADMINISTRATIVE IMPACTS

169. To forecast administrative costs associated with future section 7 consultations, we consider information received from BLM as well as public comments on the Proposed Rule. Based on the information presented in section 5.1, we do not forecast any future consultations for uranium mining. We forecast one formal consultation in 2013 for exploratory drilling by RM Potash on BLM lands. To the extent that this exploration leads to potash mining in the future, additional consultations may occur. We are not able to predict the probability and number of these consultations.
170. We forecast formal consultations for oil and gas activity based on information provided by the BLM Colorado State Office. Over the next ten years, BLM estimates that 35 new well pads will be constructed on approximately 18,000 acres of currently leased land in occupied habitat.<sup>128</sup> We use this forecast to develop a rate of well pad construction per acre per year. We then apply this rate to all currently leased acres in both Utah and Colorado, over the 20-year analysis period. Finally, we assume that, in each unit, a single company will conduct at most one consultation for its operations in the occupied portion of that unit, and one consultation for its operations in the

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<sup>125</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 8, 2013.

<sup>126</sup> Fernandez, Dan. Vice Chair, Dolores County Development Corporation. Personal communication on April 26, 2013.

<sup>127</sup> U.S. Fish and Wildlife Service. Personal communication on June 21, 2013.

<sup>128</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 8, 2013.

unoccupied portion of that unit. The resulting oil and gas consultation forecast is shown in Exhibit 5-7.

**EXHIBIT 5-7. CONSULTATION FORECAST FOR OIL AND GAS ACTIVITY IN PROPOSED CRITICAL HABITAT**

UNIT	OCCUPANCY	WELL PADS CONSTRUCTED PER YEAR	CONSULTATION FORECAST PER YEAR	CONSULTATION FORECAST OVER 20 YEARS
Monticello-Dove Creek	Occupied	2.4	1.0	21
	Unoccupied	6.7	5.8	120
San Miguel Basin	Occupied	1.5	1.5	30
	Unoccupied	0.01	0.01	0.15
<b>Total</b>		<b>11</b>	<b>8.3</b>	<b>170</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.				

171. Exhibit 5-8 presents forecast baseline administrative impacts. These impacts reflect the administrative effort associated with considering jeopardy to the species in section 7 consultations in occupied critical habitat.

**EXHIBIT 5-8. FORECAST BASELINE ADMINISTRATIVE IMPACTS TO MINERAL AND FOSSIL FUEL EXTRACTION, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$170,000	\$15,000
Piñon Mesa	\$0	\$0
San Miguel Basin	\$260,000	\$23,000
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0
Crawford	\$0	\$0
Gunnison Basin	\$0	\$0
Poncha Pass	\$0	\$0
<b>Total</b>	<b>\$430,000</b>	<b>\$38,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

#### 5.4.2 OTHER IMPACTS

172. We also consider costs associated with conservation efforts that could impact oil and gas development activity. The Service does not intend to preclude mineral or fossil fuel extraction within the proposed designation, nor do they believe they have the authority to do so.<sup>129</sup> However, communication with multiple stakeholders indicates that the most significant impacts of the listing and designation may result from companies' desire to avoid a perceived additional regulatory burden. Specifically, representatives from both Dolores and San Juan Counties note that companies currently operating in the area have expressed concern over purchasing or renewing leases, or undertaking new construction, due to the proposed listing and critical habitat designation.<sup>130</sup> Industry representatives note that time delays already occur due to the presence of the species and are expected to increase with regulation.<sup>131</sup>
173. Mineral and fossil fuel extraction activities can be sensitive to timing and location restrictions. According to the American Petroleum Institute, "critical habitat designation will result in delays and decisions to move operations, or forego operations, in areas of Gunnison sage-grouse habitat."<sup>132</sup> Representatives of Dolores County, which relies on mineral and fossil fuel extraction for employment and revenue, also note that extraction is a competitive industry and any additional cost to operators may result in the relocation of production to alternate areas.<sup>133</sup> That is, even if additional conservation efforts are not requested by the Service, the requirement for section 7 consultation may influence operators to avoid critical habitat.
174. This avoidance could result in several types of economic effects. If operators forego activity without pursuing production at substitute sites, the net change in oil and gas production at the national level would represent an efficiency effect of the regulation. If operators pursue production at substitute sites, resulting in no net change in production but redistributing activity away from sites within the proposed designation to sites outside of the proposed designation, then the opportunity cost associated with producing at the next best alternative location would represent an efficiency effect (i.e., the marginal cost of reduced profitability associated with the next best alternative location). That is, if lease sites within critical habitat are more desirable than sites outside of critical habitat – for example, in terms of revenues generated, or infrastructure and operating costs required – then the value of these differences represents the economic loss resulting from sage-grouse conservation. If activity is redistributed outside of critical habitat but the substitute sites are

<sup>129</sup> U.S. Fish and Wildlife Service. Personal communication on June 21, 2013.

<sup>130</sup> Sandberg, N. San Juan County Planner. Personal communication on March 6, 2013; and Golbricht, D., Doug Stowe, Julie Kibel, and Ernie Williams. Dolores County representatives. Personal communication on April 2, 2013.

<sup>131</sup> Lopez, Chris. Regulatory Specialist, D.J. Simmons, Inc. Personal communication on April 25, 2013.

<sup>132</sup> Ranger, Richard. Public comment submitted on behalf of the American Petroleum Institute on April 2, 2013. [Docket number FWS-R6-ES-2011-0111]

<sup>133</sup> Golbricht, D., Doug Stowe, Julie Kibel, and Ernie Williams. Dolores County representatives. Personal communication on April 2, 2013.

comparable on a cost basis to current lease sites, then there may be no expected efficiency effect. In this case, the only effect would be the distributive effect, as production shifts from one location to another. Current lease sites would experience impacts as the result of lost production, but other lease sites would experience the benefits of new production.

175. We believe that impacts in this case will be limited to distributive effects. The public comment from the American Petroleum Institute, as well as statements made in conversations with representatives of Dolores County, including the Dolores County Economic Development Corporation, suggest that operators are likely to move operations to other areas rather than forego production entirely.<sup>134</sup> According to communications with representatives of Dolores County, mineral extraction companies explained that they consider multiple locations for any given project and do not have strong preferences for one site over another.<sup>135</sup> In general, while companies attempt to select locations that minimize operating requirements, alternative sites are comparable on a cost basis because oil and gas potential is high throughout the region.<sup>136</sup> The currently leased area within the proposed designation represents only a small percentage of land available for oil and gas production. For example, the area leased for oil and gas development within critical habitat represents 1.2 percent of all BLM acres leased for oil and gas development in the State of Colorado, and less than 0.05 percent in Utah.<sup>137</sup> As shown in Exhibit 5-2, oil and gas development activity in the region is not centered within the proposed designation. This information suggests that the decision to pursue production in substitute locations is a relatively straightforward decision by the industry—that is, lease sites are not scarce enough nor the land within critical habitat preferable enough to justify additional perceived regulatory burden. As a result, while we expect that operators may choose alternative sites for oil and gas development—and we consider the regional economic effect of these choices—we believe that such changes are unlikely to generate a substantive economic efficiency effect. We do not anticipate a net change in total oil and gas production activity at the national level.
176. The American Petroleum Institute notes that regulation in areas used for mineral and fossil fuel extraction has the potential to “dramatically impact severance taxes, royalties to mineral owners (including the state school lands), jobs and the economy

<sup>134</sup> Ranger, Richard. Public comment submitted on behalf of the American Petroleum Institute on April 2, 2013. [Docket number FWS-R6-ES-2011-0111]; Golbricht, D., Doug Stowe, Julie Kibel, and Ernie Williams. Dolores County representatives. Personal communication on April 2, 2013; and Fernandez, Dan. Vice Chair, Dolores County Development Corporation. Personal communication on April 26, 2013.

<sup>135</sup> Golbricht, D., Doug Stowe, Julie Kibel, and Ernie Williams. Dolores County representatives. Personal communication on April 2, 2013.

<sup>136</sup> Fernandez, Dan. Vice Chair, Dolores County Development Corporation. Personal communication on April 26, 2013.

<sup>137</sup> Schauer, Ken. State Geospatial Manager, BLM Colorado State Office. GIS data provided via personal communication on April 5, 2013; and Utah Bureau of Land Management. GIS data for oil and gas leases accessed at: [http://www.blm.gov/ut/st/en/prog/more/geographic\\_information/gis\\_data\\_and\\_maps.html](http://www.blm.gov/ut/st/en/prog/more/geographic_information/gis_data_and_maps.html) on April 24, 2013.

in Colorado and Utah. [...]Economic impacts would fall to oil and gas operators, local communities and the region.”<sup>138</sup> Below, we describe the potential magnitude of these types of regional (distributive) impacts that could occur if oil and gas production shifts outside of the proposed designation. These regional impacts are not additive to the efficiency impacts estimated in other chapters or in the previous section of this chapter because they do not represent net changes in national economic activity.

177. To estimate regional economic impacts, we rely on existing studies of the contribution of the oil and gas industry to the States of Colorado and Utah. In particular, we use a 2007 report conducted by the Colorado Energy Research Institute (CERI) at the Colorado School of Mines, and a 2009 report conducted by the Bureau of Economic and Business Research (BEBR) at the University of Utah for the Utah Office of the Governor.<sup>139</sup> These reports provide the most recent, comprehensive information available on the economic impact of the oil and gas industry in these states. We estimate impacts associated with the listing of the sage-grouse and critical habitat designation by scaling the results of these analyses to the geographic area within the proposed designation. This analysis considers a scenario in which there is total loss of oil and gas development within the proposed designation. The Service believes this is a conservative assumption – more likely to overstate than understate actual impacts – and that the more likely result of designation.<sup>140</sup> The text box below summarizes results for both the baseline and incremental scenarios.
178. As described in the text box, baseline impacts are attributed to occupied critical habitat. In Colorado, the baseline portion of impacts is estimated to be:

- Approximately \$130 million annually; and
- Approximately 35 jobs annually.

In Utah, the baseline portion of impacts is estimated to be:

- Approximately \$200,000 annually;
- Approximately five jobs annually; and
- Approximately \$58,000 in tax revenue annually.

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<sup>138</sup> Ranger, Richard. Public comment submitted on behalf of the American Petroleum Institute on April 2, 2013. [Docket number FWS-R6-ES-2011-0111]

<sup>139</sup> Colorado Energy Research Institute, Colorado School of Mines. Oil and Gas Economic Impact Analysis. June 2007; and Bureau of Economic and Business Research, David Eccles School of Business, University of Utah. The Structure and Economic Impact of Utah’s Oil and Gas Exploration and Production Industry. July 2009.

<sup>140</sup> U.S. Fish and Wildlife Service. Personal communication on June 21, 2013.

## REGIONAL ECONOMIC IMPACT ANALYSES OF THE OIL AND GAS INDUSTRY IN COLORADO AND UTAH

If mineral or fossil fuel operators perceive sage-grouse conservation requirements and the regulatory burden of the section 7 consultation process to be too costly, these operators may choose to forego production within the proposed designation in favor of alternative locations. Although such a redistribution of economic activity is not expected to result in a net loss of production at the national level, we estimate potential impacts to local revenue and employment associated with the potential loss of production in the study area. To do so, we use existing studies of the regional economic impact of the oil and gas industry in Colorado and Utah.

### Colorado

In June 2007, CERI conducted an economic impact analysis of the oil and gas industry in Colorado. We rely on CERI's results for the Colorado portions of the Paradox and San Juan Basins, which are analyzed together in CERI's report. IEc scales CERI's results to the proposed critical habitat designation using the percent of CERI's study area that is contained within the proposed designation. We inflate all values to 2012\$ using price indexes for Gross Domestic Product from the Bureau of Economic Analysis. A summary of results is as follows:

- CERI assumes a multiplier of 1.02 for estimating indirect and induced effects from direct investment in the Paradox and San Juan Basins. That is, for every dollar of direct investment in these basins, an additional \$0.02 of economic activity is generated. According to CERI, this low multiplier reflects the fact that investment and labor supporting the extraction of resources from the Paradox and San Juan Basins generally come from out of state. In contrast, other areas rely more on in-basin expenditures and labor. For example, the multiplier for the State of Colorado overall is approximately 1.31. The use of a low multiplier results in lower regional economic impacts.
- By scaling CERI's results to the proposed designation within Colorado, we estimate that total direct, indirect, and induced impacts are:
  - Approximately \$290 million annually;
  - Approximately 79 jobs annually; and
  - Additional tax revenue is not estimated by CERI for the Paradox and San Juan Basins.
- Approximately 44 percent of these impacts occur as a result of activity in occupied habitat and are therefore assumed to occur due to the listing of the species. The remaining 56 percent occur due to activity in unoccupied habitat and are assumed to be incremental impacts of the Proposed Rule.

### Utah

In July 2009, BEBR conducted an economic impact analysis of the oil and gas industry in Utah. We rely on BEBR's results for the portion of the Paradox Basin in San Juan County, Utah. As described above, we scale these results to the proposed designation and inflate values to 2012\$. A summary of results is as follows:

- BEBR assumes a multiplier of 1.4 for estimating indirect and induced effects from direct wages in the Paradox Basin in San Juan County.
- By scaling BEBR's results to the proposed designation in San Juan County, Utah, we estimate that total direct, indirect, and induced impacts are:
  - Approximately \$400,000 annually;
  - Approximately 11 jobs annually; and
  - Approximately \$120,000 in tax revenue annually.
- Approximately 48 percent of these impacts occur in occupied habitat and are therefore assumed to occur due to the listing of the species. The remaining 52 percent occur in unoccupied habitat and are assumed to be incremental impacts of the Proposed Rule.



**5.5 INCREMENTAL IMPACTS**

179. Incremental impacts are assumed to occur in unoccupied portions of the proposed designation. Impacts are estimated according to the methodology described above. Exhibit 5-9 presents forecast incremental administrative impacts, which are considered economic efficiency effects and may be added to cost estimates from other chapters. We then summarize forecast regional economic impacts, which are considered distributive impacts and are not additive to other cost estimates.

**EXHIBIT 5-9. FORECAST INCREMENTAL ADMINISTRATIVE IMPACTS TO MINERAL AND FOSSIL FUEL EXTRACTION, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$1,100,000	\$93,000
Piñon Mesa	\$0	\$0
San Miguel Basin	\$87,000	\$7,600
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0
Crawford	\$0	\$0
Gunnison Basin	\$0	\$0
Poncha Pass	\$0	\$0
<b>Total</b>	<b>\$1,100,000</b>	<b>\$99,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

180. We estimate incremental regional impacts in unoccupied critical habitat. In Colorado, the incremental portion of impacts is estimated to be:

- Approximately \$160 million annually; and
- Approximately 44 jobs annually.

In Utah, the incremental portion of impacts is estimated to be:

- Approximately \$210,000 annually;
- Approximately five jobs annually; and
- Approximately \$62,000 in tax revenue annually.

**5.6 SUMMARY OF RESULTS**

181. This analysis forecasts baseline administrative impacts associated with mineral and fossil fuel extraction of \$430,000 (present value over 20 years). Extraction operations may also incur costs associated with implementing conservation efforts. However, because mineral and fossil fuel extraction operations may be sensitive to timing and

location restrictions, several companies have expressed concern that additional conservation requirements could lead to the total loss of production within the proposed designation in favor of alternate locations. As a result, this analysis conservatively considers the potential regional economic impact associated with the loss of mineral extraction within proposed critical habitat. Impacts include the loss of direct, indirect, and induced employment and revenue. We evaluate these impacts using existing economic impact analyses of the oil and gas industry separately for Colorado and Utah. We scale these estimates based on the acreage of proposed critical habitat within the study areas used by each regional impact analysis. Because these impacts are distributive in nature, they should not be added to estimates of administrative impacts, which are efficiency effects.

182. The incremental analysis forecasts \$1.1 million (present value over 20 years) in administrative costs. In addition, as described above, we consider regional economic impacts from the loss of oil and gas production in unoccupied habitat. Exhibit 5-10 summarizes the results of this analysis.

## EXHIBIT 5-10. SUMMARY OF FORECAST IMPACTS TO MINERAL EXTRACTION ACTIVITIES

TYPE OF IMPACT	DESCRIPTION OF IMPACT	FORECAST IMPACT
<b>BASELINE</b>		
Administrative costs	<ul style="list-style-type: none"> <li>Approximately 1 formal consultation per year for oil and gas well pads in Monticello-Dove Creek occupied habitat; and</li> <li>Approximately 1.5 formal consultations per year for oil and gas well pads in San Miguel Basin occupied habitat.</li> </ul>	\$430,000*
Conservation Efforts	<ul style="list-style-type: none"> <li>Unrealized benefits of the oil and gas industry within occupied proposed critical habitat, in the event that operations do not move to production. Oil and gas production and associated benefits are assumed to be redistributed to other locations, with no net change at the national level.</li> </ul>	<p>In the event that operations do not move to production:</p> <ul style="list-style-type: none"> <li>Annual loss of economic activity associated with oil and gas extraction in the Paradox Basin, CO, scaled to proposed occupied habitat: \$130 million, plus approximately 35 jobs; and</li> <li>Annual loss of economic activity associated with oil and gas extraction in San Juan County, UT, scaled to proposed occupied habitat: \$200,000 in wage impacts, plus \$58,000 in property taxes, plus approximately 5 jobs.</li> </ul>
<b>INCREMENTAL</b>		
Administrative Costs	<ul style="list-style-type: none"> <li>1 formal consultation in 2013 for RM Potash drilling in Monticello-Dove Creek unoccupied habitat;</li> <li>Approximately 6 formal consultations per year for oil and gas well pads in Monticello-Dove Creek unoccupied habitat; and</li> <li>Less than 1 formal consultation over 20 years for oil and gas well pads in San Miguel Basin unoccupied habitat.</li> </ul>	\$1.1 million*
Conservation Efforts	<ul style="list-style-type: none"> <li>Unrealized benefits of the oil and gas industry within proposed critical habitat, in the event that operations do not move to production. Oil and gas production and associated benefits are assumed to be redistributed to other locations, with no net change at the national level.</li> </ul>	<p>In the event that operations do not move to production:</p> <ul style="list-style-type: none"> <li>Annual loss of economic activity associated with oil and gas extraction in the Paradox Basin, CO, scaled to proposed unoccupied habitat: \$160 million, plus approximately 44 jobs; and</li> <li>Annual loss of economic activity associated with oil and gas extraction in San Juan County, UT, scaled to proposed unoccupied habitat: \$210,000 in wage impacts, plus \$62,000 in property taxes, plus approximately 5 jobs.</li> </ul>
<p><b>* Note:</b> Administrative impacts are reported in 20-year present values, discounted at seven percent.</p> <p><b>Sources:</b> Colorado Energy Research Institute, Colorado School of Mines. Oil and Gas Economic Impact Analysis. June 2007; and Bureau of Economic and Business Research, David Eccles School of Business, University of Utah. The Structure and Economic Impact of Utah's Oil and Gas Exploration and Production Industry. July 2009.</p>		

**5.7 KEY UNCERTAINTIES**

183. Exhibit 5-11 summarizes the key assumptions of the analysis of economic impacts to mineral and fossil fuel extraction activities. The exhibit also includes information on the potential direction and relative scale of bias introduced by these assumptions.

**EXHIBIT 5-11. KEY ASSUMPTIONS OF THE ANALYSIS OF ECONOMIC IMPACTS TO MINERAL EXTRACTION**

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
Fossil fuel extraction operations will choose to forego production within proposed critical habitat in order to avoid regulatory burden.	May <b>overestimate</b> impacts.	<b>Possibly major.</b> This analysis reports estimated economic impacts associated with the loss of fossil fuel extraction in critical habitat. This assumption is based on statements from oil and gas companies that costs, including time delays, associated with section 7 consultation may lead operators to forego production within the proposed designation in favor of alternate locations. Because the Service does not intend to preclude mineral or fossil fuel development, this would be a non-section 7 impact of regulation. To the extent that operations are able to absorb costs and continue to production, this assumption overestimates distributional impacts to local economies.
Economic impacts associated with fossil fuel extraction are evenly distributed across the Paradox and San Juan Basins in Colorado and Utah.	<b>Unknown.</b> May overestimate or underestimate impacts.	<b>Possibly major.</b> This analysis scales reported economic impacts associated with the oil and gas industry in these areas based on acreage in proposed critical habitat. To the extent that areas leased for oil and gas development within proposed critical habitat are more or less productive than other areas within these basins, this analysis may underestimate or overestimate impacts.
Future fossil fuel extraction will be evenly distributed across existing leases in proposed critical habitat.	<b>Unknown.</b> May overestimate or underestimate impacts.	<b>Probably minor.</b> This analysis develops a section 7 consultation forecast across the proposed designation based on well pad construction forecasts from Colorado BLM. This assumption only affects the forecast consultation rate.

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
Future fossil fuel extraction on public lands will only occur on existing leases.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> The forecast rate of well pad construction relies on predictions from Colorado BLM. Many existing leases in the proposed designation are not currently producing. Therefore, we assume that the development of new leases is unlikely. This assumption only affects the forecast consultation rate.
A single oil and gas company will participate in at most one formal consultation for oil and gas activity in the occupied and unoccupied portions of a given unit.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> To the extent that companies conduct separate section 7 consultations for each new well pad constructed, this assumption may underestimate administrative impacts in some units.
The extent of future potash mining within proposed critical habitat cannot be predicted.	May <b>underestimate</b> impacts.	<b>Possibly major.</b> This analysis forecasts one formal consultation for planned exploration. If mining activity continues based on the results of the exploration, this analysis may underestimate administrative impacts and costs associated with any required conservation efforts.
The probability that uranium mining will resume within proposed critical habitat over the analysis period cannot be predicted.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> Uranium mining does not currently occur within the proposed designation. Current proposals suggest that mining activity may occur in the future. However, information is not available to predict when these activities might resume, or the extent to which mining will occur.

## CHAPTER 6 | POTENTIAL ECONOMIC IMPACTS TO RESIDENTIAL AND RELATED DEVELOPMENT

184. The Proposed Rule identifies residential and related development as a potential threat to the sage-grouse and its habitat.<sup>141</sup> Construction of buildings, as well as associated infrastructure including roads, utilities, and fences, may result in habitat loss and degradation within the proposed designation.
185. This chapter forecasts real estate development and monetizes potential impacts associated with sage-grouse conservation efforts on private lands within the proposed designation. The chapter proceeds as follows: Section 6.1 provides background information on development activities within the proposed designation. Section 6.2 discusses existing baseline conservation efforts. Section 6.3 describes the potential for incremental conservation efforts. Section 6.4 summarizes the methodology used in the development analysis, and presents our forecast of baseline impacts. Section 6.5 presents our forecast of incremental impacts. Section 6.6 summarizes the results, and section 6.7 discusses key uncertainties of the analysis.
- 6.1 SCOPE AND SCALE OF RESIDENTIAL DEVELOPMENT**
186. Development activities may threaten the sage-grouse and its habitat as a result of habitat fragmentation and destruction resulting from land clearing activities. Although residential development activities may result in additional development of infrastructure (e.g., roads or powerlines) on Federal lands, our analysis only considers potential impacts from development of privately owned lands. All proposed critical habitat units contain privately owned lands that may be developed in the future.
187. The proposed designation is predominantly rural. The primary source of development within the proposed designation is the City of Gunnison in the Gunnison Basin unit. Other cities proximate to the proposed designation include Grand Junction, which is located to the northeast of the Piñon Mesa unit, and Crested Butte, which is located to the north of the Gunnison Basin unit. In general, population growth and development in Gunnison County has been focused in the Crested Butte area outside of critical habitat, rather than in the area surrounding the town of Gunnison.<sup>142</sup>
188. The extent to which additional development is expected to occur depends on many factors, including future population growth. Other factors that influence future

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<sup>141</sup> 2013 Proposed Rule, 78 FR 2553.

<sup>142</sup> Westbay, S. K. Coleman., J. Cochrane, W. Hansen. City of Gunnison and Gunnison County. Personal Communication on March 21, 2013.

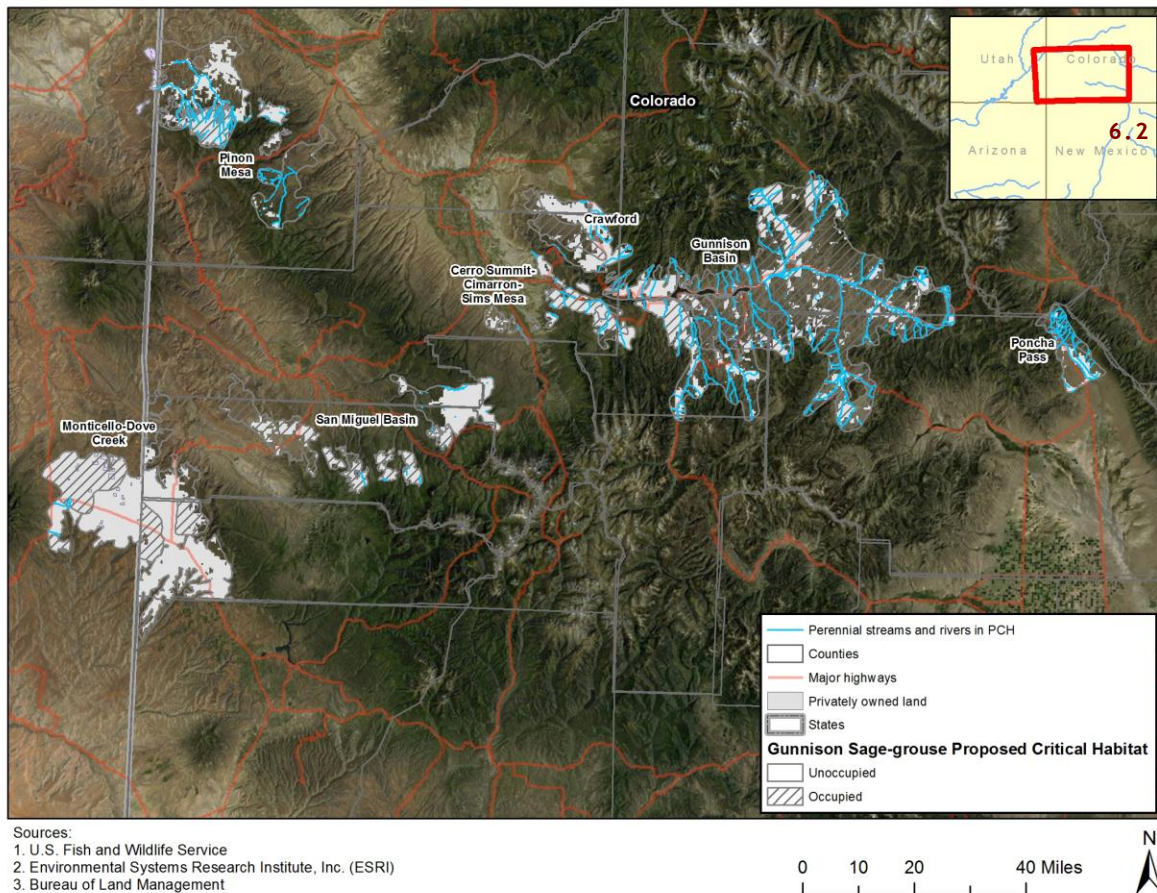
development include county plans, local economic conditions, availability of water, and proximity to services and attractions, such as ski resorts or recreational opportunities. To account for these factors, we conducted interviews with county planners, consulted county planning documents, and reviewed public comments submitted in response to the proposed listing and critical habitat rules. Many of the counties within the proposed designation do not anticipate extensive future development. These counties note that minimal population growth is expected as a result of current economic conditions, a lack of available water supply, other competing land uses such as grazing and agriculture, and the remoteness of these areas.<sup>143</sup> Further discussion of these particular issues for each proposed unit and county can be found in Exhibit 6-2.

189. Development projects will only require section 7 consultation with the Service if a Federal nexus is present. Potential sources of a Federal nexus for residential developments include Federal funding or issuance of a section 404 CWA permit from the Corps. Given the rural nature of the study area, we assume that Corps permits are the most likely nexus. These permits will only be required for projects directly affecting waters under the jurisdiction of the Corps. Exhibit 6-1 shows the location of perennial streams and rivers within critical habitat, which we assume may trigger the requirement for a Corps permit. The exhibit also identifies privately owned land that is the focus of this analysis.

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<sup>143</sup> Starkebaum, N. Gunnison County. Personal communication on March 4, 2013; Whitmore, M. Attorney. Ouray County. Personal communication on March 18, 2013.; Fife, K. Mesa County. Personal communication on March 11, 2013.



**EXHIBIT 6-1. STUDY AREA FOR RESIDENTIAL AND RELATED DEVELOPMENT****6.2 EXISTING BASELINE CONSERVATION EFFORTS**

190. Exhibit 6-2 provides an overview of local development trends across the counties affected by the designation. The exhibit also describes existing baseline conservation efforts that may benefit the sage-grouse and its habitat. In particular, conservation easements across the proposed designation permanently protect many areas from future residential development.

## EXHIBIT 6-2. LOCAL DEVELOPMENT CONDITIONS

COUNTY	DESCRIPTION OF PAST AND EXPECTED DEVELOPMENT TRENDS
MONTICELLO-DOVE CREEK	
Dolores	<b>Past Trends:</b> Since 1970, only 457 homes have been constructed in west Dolores County. <sup>144</sup> <b>Future Limitations:</b> Projected population growth is minimal. Much agricultural land is enrolled in CRP. <sup>145</sup>
Montrose	<b>Future Limitations:</b> Population loss is expected for west end of county. <sup>146</sup>
San Juan	<b>Expected Development:</b> Several development projects are planned for the area of the proposed designation: Elk Meadows (489 acres with six homes currently constructed); Ranches at Elk Meadows (640 acres, yet to be developed); and a proposed subdivision two miles south of Monticello. <sup>147</sup> <b>Future Limitations:</b> Conservation easements protect 2,654 acres of private land in occupied critical habitat. <sup>148</sup>
San Miguel	<b>Future Limitations:</b> The county has spent approximately \$1.2 million to place nearly 3,000 acres of occupied sage-grouse habitat in conservation easements through its Land Heritage Program. <sup>149</sup>
PIÑON MESA	
Grand	<b>Expected Development:</b> Proposed designation includes minimal private land.
Mesa	<b>Expected Development:</b> Construction of approximately 30 houses is expected over the next 20 years within proposed designation. Piñon Mesa /Glade Park community may experience impacts. <sup>150</sup> <b>Future Limitations:</b> Conservation easements cover approximately 40 percent of private land within proposed designation. Master Plan promotes 35+ acre agricultural tracts, as well as cluster development, conservation easements, and other conservation techniques for Piñon Mesa/Glade Park. Development is limited by lack of groundwater, and the 2000 Piñon Mesa Gunnison Sage-grouse Conservation Plan. <sup>151</sup>

<sup>144</sup> Stowe, Douglas R., Julie R. Kibel, Ernest R. Williams. Public comment submitted on behalf of the Dolores County Board of County Commissioners on March 27, 2013.

<sup>145</sup> *Ibid.*

<sup>146</sup> White, S and. J Waschbusch. Montrose County. Personal communication on April 8, 2013.

<sup>147</sup> Sandberg, N. San Juan County Planner. Personal communication on March 6, 2013.

<sup>148</sup> Maryboy, Kenneth. Public comment submitted on behalf of the San Juan County Commission on April 1, 2013

<sup>149</sup> Fischer, E., A. Goodtimes, J. May. Public comment on behalf of San Miguel County Board of Commissioners submitted on April 2, 2013.

<sup>150</sup> Fife, K. Mesa County. Personal communication on March 12, 2013

<sup>151</sup> Justman, J. Public comment on behalf of Mesa County Board of County Commissioners submitted on April 2, 2013.

COUNTY	DESCRIPTION OF PAST AND EXPECTED DEVELOPMENT TRENDS
SAN MIGUEL BASIN	
Montrose	<b>Future Limitations:</b> Population loss is expected for west end of county. <sup>152</sup>
Ouray	<b>Expected Development:</b> The county expressed concern that the designation could limit home construction on undeveloped, privately owned lands. <sup>153</sup> The Cornerstone Project, a planned residential, golf, and equestrian development, will overlap the northeast corner of the San Miguel Basin unit. This project is currently on hold due to financial constraints. <sup>154</sup>
San Miguel	<b>Expected Development:</b> Land surrounding the Cone Reservoir within occupied habitat in San Miguel Basin was divided into 35-acre parcels in 2012. Construction has begun on at least one parcel. <sup>155</sup> <b>Future Limitations:</b> The county has spent approximately \$1.2 million to place nearly 3,000 acres of occupied sage-grouse habitat in conservation easements through its Land Heritage Program. <sup>156</sup>
CERRO SUMMIT-CIMARRON-SIMS MESA	
Gunnison	<b>Expected Development:</b> Over 10 years, the county has issued approximately 17 building permits per year in occupied habitat for remodeling, and porch and deck construction (not new construction). <sup>157</sup>
Montrose	<b>Past Trends:</b> Between 2003 and 2012, three subdivision applications resulted in five lots of less than 35 acres. <sup>158</sup> <b>Future Limitations:</b> Development is limited by the lack of water availability. <sup>159</sup>
Ouray	<b>Expected Development:</b> The county expressed concern that the designation could limit home construction on undeveloped, privately owned lands. <sup>160</sup>
CRAWFORD	
Delta	<b>Expected Development:</b> There are no planned development projects in this area. The last development application was more than four years ago. <sup>161</sup> <b>Future Limitations:</b> Development is limited by economic downturn, increasing agricultural commodity prices, and existing conservation easements. <sup>162</sup>

<sup>152</sup> White, S and. J Waschbusch. Montrose County. Personal communication on April 8, 2013.

<sup>153</sup> Fedel, F.M., L.M. Padgett, D. Batchelder. Public comment on behalf of Ouray County Board of County Commissioners submitted on March 26, 2013.

<sup>154</sup> Whitmore, M. Attorney. Ouray County. Personal communication on March 18, 2013.

<sup>155</sup> Fischer, E., A. Goodtimes, J. May. Public comment on behalf of San Miguel County Board of Commissioners submitted on April 2, 2013.

<sup>156</sup> *Ibid.*

<sup>157</sup> Harriman, E., E. Seymour, S. Cave, B. Nesbitt, R. Drexel. Public comment on behalf of the City of Gunnison submitted on March 26, 2013.

<sup>158</sup> Henderson, R., D. White, G. Ellis. Public comment on behalf of Montrose County Board of County Commissioners submitted on April 1, 2013.

<sup>159</sup> *Ibid.*

<sup>160</sup> Fedel, F.M., L.M. Padgett, D. Batchelder. Public comment on behalf of Ouray County Board of County Commissioners submitted on March 26, 2013.

<sup>161</sup> Atchley, C.D., C.B. Hovde, J.M. Roeber. Public comment on behalf of Delta County Board of County Commissioners submitted on March 30, 2013.

COUNTY	DESCRIPTION OF PAST AND EXPECTED DEVELOPMENT TRENDS
Gunnison	<b>Expected Development:</b> Over 10 years, the county has issued approximately 17 building permits per year in occupied habitat for remodeling, and porch and deck construction (not new construction). <sup>163</sup>
GUNNISON BASIN	
Gunnison	<p><b>Past Trends:</b> Between 2003-2007, five development projects of 35+ acres occurred within occupied habitat. Since 2007, no projects have occurred.<sup>164</sup></p> <p><b>Expected Development:</b> Over 10 years, the county has issued approximately 17 building permits per year in occupied habitat for remodeling, and porch and deck construction (not new construction).<sup>165</sup></p> <p>The City of Gunnison and Gunnison Valley Partners recently annexed 640 acres to the east of the city for development. The annexation includes mitigation measures for the sage-grouse, including the designation of 450 acres as open space, and the sale of 200 acres to CPW for a conservation easement.<sup>166</sup> The annexation agreement also relinquished grazing permits on BLM and USFS land in the Taylor Park Pool.<sup>167</sup> Mitigation measures were approved by the Gunnison Basin Sage-grouse Strategic Committee and CPW.<sup>168,169</sup></p> <p><b>Future Limitations:</b> Population growth rates are highest around Crested Butte (outside of the proposed designation). Annual growth rate in the area of the proposed designation is likely to be less than one percent.</p> <p>The Three-Mile/Urban Growth Boundary Intergovernmental Agreement allows the City of Gunnison to review all development within three miles of the city. The Strategic Plan encourages new developments to be located in areas already connected to water and sewer services.<sup>170</sup></p>
Hinsdale	<b>Expected Development:</b> High Bridge Ranch Subdivision will subdivide approximately 750 acres into 5-8-acre parcels. Project could generate \$22 million through lot sales. County is concerned that this project would not proceed as a result of the designation. <sup>171</sup>
Saguache	<b>Expected Development:</b> No subdivisions are planned at this time. Proposed designation is predominantly ranching and farming land. <sup>172</sup> However, proximity to more developed areas is expected to lead to additional development in the future. <sup>173</sup>

<sup>162</sup> *Ibid.*

<sup>163</sup> Harriman, E., E. Seymour, S. Cave, B. Nesbitt, R. Drexel. Public comment on behalf of the City of Gunnison submitted on March 26, 2013.

<sup>164</sup> Swenson, P., P. Chamberland, J. Houck. Public comment on behalf of the Board of County Commissioners of the County of Gunnison, Colorado submitted on April 2, 2013.

<sup>165</sup> Harriman, E., E. Seymour, S. Cave, B. Nesbitt, R. Drexel. Public comment on behalf of the City of Gunnison submitted on March 26, 2013.

<sup>166</sup> Henkel, M. and M. Coghill. 2009. Mitigation Recommendation: Gunnison Valley Partners-Gunnison Rising Project Wildlife/Gunnison Sage-Grouse.

<sup>167</sup> Westbay, S. City of Gunnison. Personal communication on April 25, 2013.

<sup>168</sup> Stahlnecker, K. Letter to City of Gunnison and Gunnison Valley Partners Re: Gunnison Rising Annexation. April 9, 2009.

<sup>169</sup> Wenum, J. Letter to City of Gunnison and Gunnison Basin Sage Grouse Strategic Committee Re: Gunnison Rising Annexation. February 4, 2009.

<sup>170</sup> Harriman, E., E. Seymour, S. Cave, B. Nesbitt, R. Drexel. Public comment on behalf of the City of Gunnison submitted on March 26, 2013.

<sup>171</sup> Dozier, C., S. Whinnery, S. Thompson. Comment submitted on behalf of Hinsdale County on May 1, 2013.

<sup>172</sup> Maez, W. Saguache County. Personal communication on April 4, 2013.

<sup>173</sup> Gunnison Sage-Grouse Rangewide Conservation Plan. Gunnison Sage-Grouse Rangewide Steering Committee, Colorado Division of Wildlife. April 2005.

COUNTY	DESCRIPTION OF PAST AND EXPECTED DEVELOPMENT TRENDS
PONCHA PASS	
Chaffee	<b>Expected Development:</b> Minimal overlap between critical habitat and Chaffee County. No expected effects. <sup>174</sup>
Saguache	<b>Expected Development:</b> No subdivisions are planned at this time. Proposed designation is predominantly ranching and farming land. <sup>175</sup> However, proximity to more developed areas is expected to lead to additional development in the future. <sup>176</sup>

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<sup>174</sup> Reimer, D. Chaffee County. Personal communication on April 1, 2013

<sup>175</sup> Maez, W. Saguache County. Personal communication on April 4, 2013.

<sup>176</sup> Gunnison Sage-Grouse Rangewide Conservation Plan. Gunnison Sage-Grouse Rangewide Steering Committee, Colorado Division of Wildlife. April 2005.

**6.3 POTENTIAL INCREMENTAL CONSERVATION EFFORTS**

191. As described in Chapter 2, conservation efforts requested to avoid adverse modification of critical habitat are expected to be similar to those requested to avoid jeopardy to the species. Since development projects are not expected to result in significant alteration of habitat, we do not forecast additional project modifications beyond what would be requested to avoid jeopardy to the species. Based on information provided by the Service and examples of previous development projects that purchased land set-asides for sage-grouse conservation, we assume that some development projects will require land set-asides as conservation efforts following the listing of the species and the designation of critical habitat.<sup>177</sup> We assume that incremental conservation efforts will be limited to land set-asides for projects occurring in unoccupied critical habitat. Conservation efforts for these projects would not have been required absent the designation of critical habitat.

**6.4 BASELINE IMPACTS**

192. To evaluate potential impacts associated with residential and related development, we rely on GIS land cover data, county-level population projections through 2032, and communication with county planners. We first identify all potentially developable land within the proposed designation, then forecast the number of future development projects using population projections and current population densities. We compare the results of this analysis to information provided by county planners (see Exhibit 6-2 above) and modify as appropriate. The following section describes these modifications. Finally, using assumptions about the average acreage of development projects and the probability that a given project will require a Corps permit, we convert this development forecast into an annual rate of future section 7 consultations. For all projects assumed to require section 7 consultation, we also quantify impacts associated with potential land set-asides. The steps of this analysis are described in more detail in the following sections.
193. In occupied habitat, consultations and associated land set-asides are assumed to occur in the baseline due to the listing of the species. Incremental impacts are those associated with consultations and land set-asides in unoccupied habitat, as well as the portion of administrative effort to consider adverse modification of critical habitat in occupied portions of the proposed designation.

**6.4.1 POTENTIAL DEVELOPMENT IN PROPOSED CRITICAL HABITAT**

194. To estimate the number of acres that may be developed within critical habitat, we first identify potentially developable land within each proposed unit. We use GIS land cover data from the 2006 National Land Cover Database to eliminate areas where future development could not reasonably be expected, including already

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<sup>177</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013. (15); and May, J. Public comment submitted on behalf of San Miguel County Board of County Commissioners on April 2, 2013.



developed areas, wetlands, open water, and barren/rocky land.<sup>178</sup> In addition, we exclude from our analysis all Federal lands and lands that are covered by a conservation easement according to the Protected Areas Database of the U.S.<sup>179</sup> The remaining lands, which include privately owned cultivated, forest, and herbaceous lands not protected by conservation easement, are considered to be potentially developable.

195. We then determine the level of future population growth expected across the designation based on county-level population projections from the Colorado State Demography Office and the Utah's Governor's Office of Planning and Budget.<sup>180</sup> Assuming that future development will be evenly distributed across developable lands, we multiply projected population growth in each county by the percentage of developable land located within critical habitat in that county. This results in an estimate of projected population growth within the proposed designation, by county. To calculate acres of future development, we divide projected population growth by current population density for each county, as calculated from county-level population data and acres of already-developed land.<sup>181</sup> This assumes that future development will only occur to the level of current population density.
196. We also consider that land set-asides may be requested as project modifications for future development projects, based on information provided by the Service and examples of previous projects that purchased land set-asides for sage-grouse conservation.<sup>182</sup> Assuming that one acre of conservation land is purchased for every acre developed, no more than 50 percent of developable land in each unit may be developed. Forecast population growth rates in the study area are low enough that this requirement does not affect the acres of projected development.

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<sup>178</sup> U.S. Geological Survey. National Land Cover Database 2006 (NLCD2006). Downloaded from: [www.mrlc.gov/finddata.php](http://www.mrlc.gov/finddata.php) on April 24, 2013.

<sup>179</sup> U.S. Geological Survey, Gap Analysis Program (GAP). November 2012. Protected Areas Database of the United States (PADUS), version 1.3 Combined Feature Class.

<sup>180</sup> Colorado Department of Local Affairs, State Demography Office. Preliminary Population Forecasts for Colorado Counties, 2000-2040 (1-year increments). Downloaded from: <http://www.colorado.gov/cs/Satellite?c=Page&childpagename=DOLA-Main%2FCBONLayout&cid=1251593346867&pagename=CBONWrapper> on May 24, 2013; and Utah Governor's Office of Planning & Budget. 2012 Baseline County Population Projections. Downloaded from: <http://www.governor.utah.gov/dea/projections.html> on May 24, 2013.

<sup>181</sup> Colorado Department of Local Affairs, State Demography Office. Preliminary Population Forecasts for Colorado Counties, 2000-2040 (1-year increments). Downloaded from: <http://www.colorado.gov/cs/Satellite?c=Page&childpagename=DOLA-Main%2FCBONLayout&cid=1251593346867&pagename=CBONWrapper> on May 24, 2013; Utah Governor's Office of Planning & Budget. 2012 Baseline County Population Projections. Downloaded from: <http://www.governor.utah.gov/dea/projections.html> on May 24, 2013; and U.S. Geological Survey. National Land Cover Database 2006 (NLCD2006). Downloaded from: [www.mrlc.gov/finddata.php](http://www.mrlc.gov/finddata.php) on April 24, 2013.

<sup>182</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013. (15); and May, J. Public comment submitted on behalf of San Miguel County Board of County Commissioners on April 2, 2013.



197. Finally, based on communication with county planners and information received in public comments, we modify our estimates of future development as appropriate. These adjustments include:

- **Delta County:** Information from Delta County notes that the most recent development application in the proposed designation was submitted more than four years ago.<sup>183</sup> Therefore, for the portion of the Crawford unit in Delta County, we conservatively assume one development project every five years.
- **Hinsdale County:** Our GIS analysis forecasts minimal development in the small portion of critical habitat in Hinsdale County. The county submitted a comment noting the potential for impacts to the High Bridge Ranch subdivision, which is currently being developed.<sup>184</sup> As a result, our analysis forecasts costs associated with one project.
- **Mesa County:** Mesa County provided population projections specific to proposed critical habitat within the county. We use these projections in our analysis rather than estimating growth based on county-level projections.<sup>185</sup>
- **Montrose County:** We do not forecast any impacts in the portion of the Crawford unit in Montrose County, based on statements from the county that development is not expected.<sup>186</sup> For the portion of Montrose County within the Cerro Summit-Cimarron-Sims Mesa unit, we assume a rate of three development projects over ten years, based on data for years between 2003 and 2012.<sup>187</sup>
- **San Miguel County:** We modify the analysis for the portion of the San Miguel Basin unit in San Miguel County to reflect ongoing construction of the Cone Reservoir development project.<sup>188</sup> We assume one consultation in 2013 to consider development in the Cone Reservoir area; no other consultations for San Miguel Basin occupied habitat are anticipated.

#### 6.4.2 SECTION 7 CONSULTATION FORECAST

198. To estimate administrative impacts associated with sage-grouse conservation, we apply information on typical project size and the probability of a Federal nexus to develop a future rate of formal section 7 consultations. Our analysis assumes an average project size of 35 acres, based on the minimum parcel size that does not

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<sup>183</sup> Atchley, C.D., C.B. Hovde, J.M. Roeber. Public comment submitted on behalf of Delta County Board of County Commissioners on March 30, 2013.

<sup>184</sup> Dozier, C., S. Whinnery, S. Thompson. Comment submitted on behalf of Hinsdale County on May 1, 2013.

<sup>185</sup> Fife, K., L. Dannenberger. Mesa County. Personal communication on March 11, 2013.

<sup>186</sup> White, S and. J Waschbusch. Montrose County. Personal communication on April 8, 2013.

<sup>187</sup> Henderson, R., D. White, G. Ellis. Public comment submitted on behalf of Montrose County on April 1, 2013.

<sup>188</sup> May, J. Public comment submitted on behalf of San Miguel County on April 2, 2013.

require county approval for subdivision. Colorado state law dictates that subdivision of land to parcels of 35 acres or greater can occur without county oversight, although counties maintain oversight over development and construction on these parcels.<sup>189</sup> Using this assumption of typical project size, we are able to estimate the number of future development projects associated with the acres of projected development.

199. We then consider the probability that a Federal nexus for section 7 consultation will be present for a given project. The most likely source of a Federal nexus for development projects on private lands is a section 404 CWA permit issued through the Corps. Using GIS analysis, we estimate the probability that a 35-acre development project within the proposed designation will intersect a perennial stream or river. We assume that projects not intersecting a perennial water source will not require a permit from the Corps, and will therefore not require section 7 consultation. We estimate this probability by dividing developable land within the proposed designation into a grid of 35-acre square parcels. We then calculate the percentage of parcels that intersect a perennial water source. Because 11 percent of square parcels intersect a stream or river, we assume that 11 percent of forecast development projects will require consultation with the Service. This assumption may underestimate impacts if developers prefer to construct new projects near available water sources. See Exhibit 6-1 for the location of streams and rivers intersecting the proposed designation. In some cases, a Federal nexus could also exist if rights-of-way or associated infrastructure cross adjacent Federal lands. Because we are unable to predict the probability that a given development project will intersect both Federal and private land, we assume that a permit from the Corps is the most likely source of a Federal nexus. This assumption may result in an underestimation of impacts.
200. Data provided by the Corps confirm that the agency's jurisdiction within the proposed designation is likely limited. Because of limitations to the data, we are not always able to identify the economic activity associated with a given permit. However, the data indicate that, within developable land in the proposed designation, at most 14 permits were issued for development projects between 2008 and 2013. All of these projects were located within Gunnison County.<sup>190</sup> Because of uncertainty about the number of Corps permits associated with residential and related development, we rely on the consultation forecast described above. Compared to the Corps data, this analysis may overestimate the number of future section 7 consultations in areas outside of Gunnison County, but may underestimate the number of consultations within Gunnison County.

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<sup>189</sup> Swenson, P., P. Chamberland, J. Houck. Public comment on behalf of the Board of County Commissioners of the County of Gunnison, Colorado submitted on April 2, 2013.

<sup>190</sup> Imamura, E.R., U.S. Army Corps of Engineers, Sacramento District. Email communication on May 30, 2013.

#### 6.4.3 PURCHASE OF LAND SET-ASIDES

201. Based on information provided by the Service, we assume that future development projects within proposed critical habitat may entail the purchase of land set-asides to compensate for habitat destruction.<sup>191</sup> In particular, developers may purchase and permanently protect undeveloped sage-grouse habitat through the establishment of conservation easements. Our analysis assumes an off-setting ratio of 1:1 for each development project participating in section 7 consultation with the Service. To quantify the costs associated with purchasing land offsets, our analysis assumes a per-acre cost of \$640, based on information from the National Agricultural Statistics Service 2012 Land Values Summary.<sup>192</sup> The average value of pastureland (which we assume is representative of sage-grouse habitat) in the State of Colorado was \$640 per acre in 2012. In Utah, this value was \$920 per acre. Because the majority of development in sage-grouse habitat is projected to occur in Colorado, and in order to avoid overstating potential impacts, we rely on the average value per acre for Colorado.
202. The cost of purchasing land set-asides in occupied habitat is assumed to occur in the baseline due to the listing of the species. The cost of purchasing land set-asides in unoccupied habitat is considered an incremental impact of the Proposed Rule. Because forecast development in each unit is low relative to total developable land and because the cost of land set-asides is relatively low, we do not estimate land value losses associated with restricting development. Instead, we estimate the cost required to purchase land set-asides. To the extent that development pressure increases in the future, this analysis may underestimate impacts.

#### 6.4.4 BASELINE IMPACTS SUMMARY

203. We forecast baseline impacts of \$180,000 (present value over 20 years), as presented in Exhibit 6-3. These impacts are associated with the portion of administrative effort to consider jeopardy to the species for projects in occupied habitat, as well as the cost to purchase land set-asides in occupied habitat. Approximately \$110,000 of baseline impacts are associated with purchasing land set-asides to offset destruction of sage-grouse habitat. The remaining \$72,000 are associated with administrative effort to consider jeopardy to the species in consultations.

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<sup>191</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013. (15)

<sup>192</sup> U.S. Department of Agriculture. National Agricultural Statistics Service. Land Values 2012 Summary. August 2012.

**EXHIBIT 6-3. FORECAST BASELINE IMPACTS TO DEVELOPMENT BY SOURCE, 2013-2032  
(2012\$, 7% DISCOUNT RATE)**

UNIT	ADMINISTRATIVE COSTS		LAND SET-ASIDES	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$6,900	\$610	\$10,000	\$900
Piñon Mesa	\$270	\$24	\$400	\$36
San Miguel Basin	\$15,000	\$1,300	\$22,000	\$2,000
Cerro Summit-Cimarron-Sims Mesa	\$3,100	\$280	\$4,700	\$410
Crawford	\$1,100	\$95	\$1,600	\$140
Gunnison Basin	\$44,000	\$3,900	\$66,000	\$5,900
Poncha Pass	\$1,200	\$110	\$1,800	\$160
<b>Total</b>	<b>\$72,000</b>	<b>\$6,400</b>	<b>\$110,000</b>	<b>\$9,500</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.				

#### 6.4.5 CONSIDERATION OF ANCILLARY IMPACTS

204. In addition to the direct impacts associated with section 7 consultations and associated land set-asides, representatives of several counties have expressed concern that the designation may have ancillary effects on development patterns due to restrictions on other economic activities. In some cases, counties are concerned about impacts to areas outside of proposed critical habitat. For example, representatives of Montrose County expressed concern that potential economic impacts to mineral extraction activities could affect future development rates in the mining towns of Nucla and Naturita, which are located to the north of occupied critical habitat in the San Miguel Basin unit.<sup>193</sup> Similarly, representatives of Dolores County, which receives approximately 65 percent of its revenue from the oil and gas industry, noted that impacts to the oil and gas industry could result in a decline in employment, foreclosures, or other changes to residential and related development.<sup>194</sup> As discussed in Chapter 5, the Service does not intend to preclude mineral and fossil fuel development within the proposed designation, nor do they believe they have the authority to do so. As a result, we assume that such ancillary impacts are not likely to occur.

<sup>193</sup> Henderson, R., D. White, G. Ellis. Public comment on behalf of Montrose County Board of County Commissioners submitted on April 1, 2013; and Personal communication with J. Waschbusch and S. White, Montrose County. April 8, 2013.

<sup>194</sup> Stowe, D.R., J.R. Kibel, E.R. Williams. Public comment on behalf Dolores County Board of County Commissioners submitted on March 27, 2013.

205. Other county representatives have suggested that changes in land use within the proposed designation may result from the desire of ranchers and farmers to avoid a potential Federal nexus for section 7 consultation. For example, Gunnison County representatives expressed concern that, as a result of the proposed listing and critical habitat designation, agricultural land owners may choose to sell land for development.<sup>195</sup> Representatives of Ouray County also noted the potential for subdivision of rangeland, depending on the scale of impacts to grazing operations.<sup>196</sup> We do not anticipate significant impacts associated with changes in land use due to the low rates of future population growth and forecast development in the study area.

#### **6.5 INCREMENTAL IMPACTS**

206. We estimate incremental impacts using the same analytical approach described in the previous section. In unoccupied habitat, consultations are assumed to occur as a result of critical habitat designation. Therefore, all associated administrative costs and costs of purchasing land set-asides are considered incremental. In occupied habitat, administrative effort is required to consider both jeopardy to the species and adverse modification of critical habitat. The portion of administrative effort to address adverse modification is considered an incremental impact.
207. We estimate incremental impacts of \$190,000 (present value over 20 years). Approximately \$98,000 of these impacts are associated with purchasing land set-asides. The remaining \$90,000 are administrative impacts associated with considering adverse modification in section 7 consultation. Exhibit 6-4 summarizes these results.

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<sup>195</sup> Westbay, S. K. Coleman. City of Gunnison. Personal Communication on March 21, 2013; Cochrane, J. Gunnison County. Personal communication on March 21, 2013.

<sup>196</sup> Whitmore, M. Attorney. Ouray County. Personal communication on March 18, 2013.

**EXHIBIT 6-4. FORECAST INCREMENTAL IMPACTS TO DEVELOPMENT BY SOURCE, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	ADMINISTRATIVE COSTS		LAND SET-ASIDES	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$29,000	\$2,500	\$39,000	\$3,500
Piñon Mesa	\$360	\$32	\$400	\$36
San Miguel Basin	\$24,000	\$2,100	\$28,000	\$2,500
Cerro Summit-Cimarron-Sims Mesa	\$4,700	\$410	\$5,400	\$480
Crawford	\$4,400	\$390	\$6,100	\$530
Gunnison Basin	\$25,000	\$2,200	\$15,000	\$1,300
Poncha Pass	\$2,700	\$240	\$3,500	\$310
<b>Total</b>	<b>\$90,000</b>	<b>\$7,900</b>	<b>\$98,000</b>	<b>\$8,700</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.				

#### 6.6 SUMMARY OF RESULTS

208. This analysis forecasts baseline impacts of \$180,000 (present value over 20 years) and incremental impacts of \$190,000 (present value over 20 years). These impacts are associated with approximately 15 section 7 consultations for development projects over the 20-year time period, as well as the cost of purchasing land set-asides. Exhibits 6-5 and 6-6 summarize the baseline and incremental results of this analysis.

**EXHIBIT 6-5. FORECAST BASELINE IMPACTS TO RESIDENTIAL AND RELATED DEVELOPMENT, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$17,000	\$1,500
Piñon Mesa	\$670	\$60
San Miguel Basin	\$37,000	\$3,300
Cerro Summit-Cimarron-Sims Mesa	\$7,800	\$690
Crawford	\$2,700	\$240
Gunnison Basin	\$110,000	\$9,800
Poncha Pass	\$3,100	\$270
<b>Total</b>	<b>\$180,000</b>	<b>\$16,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT 6-6. FORECAST INCREMENTAL IMPACTS TO RESIDENTIAL AND RELATED DEVELOPMENT, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$68,000	\$6,000
Piñon Mesa	\$770	\$68
San Miguel Basin	\$52,000	\$4,600
Cerro Summit-Cimarron-Sims Mesa	\$10,000	\$890
Crawford	\$10,000	\$920
Gunnison Basin	\$40,000	\$3,500
Poncha Pass	\$6,200	\$550
<b>Total</b>	<b>\$190,000</b>	<b>\$17,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**6.7 KEY UNCERTAINTIES**

209. Exhibit 6-7 summarizes the key assumptions in the analysis of potential economic impacts to residential and related development. The exhibit also provides information on the potential direction and relative scale of bias introduced by these assumptions.



**EXHIBIT 6-7. KEY ASSUMPTIONS OF THE ANALYSIS OF ECONOMIC IMPACTS TO RESIDENTIAL  
AND RELATED DEVELOPMENT**

ASSUMPTION/ SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
The percentage of developable land in a county located within proposed critical habitat and county-wide population projections can accurately forecast expected development.	May <b>overestimate</b> impacts.	<b>Probably minor.</b> In general, county representatives expect rates of population growth within the proposed designation to be lower than rates for the county. We have adjusted our forecast of future development where more specific data are available.
The Service will not recommend additional conservation efforts beyond land set-asides.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> County representatives do not anticipate additional conservation efforts. To the extent that additional conservation efforts are requested, some participating landowners may incur additional costs.
The Service will request a one-to-one land set-aside ratio across the proposed designation.	<b>Unknown.</b> May overestimate or underestimate impacts.	<b>Probably minor.</b> Land set-aside ratios may be determined based on site-specific conditions. We forecast a relatively small number of development projects for the next 20 years. As a result, the effect of this assumption on estimated costs is likely to be minor.
The cost associated with land set-asides is the cost of purchasing the land and establishing a conservation easement, rather than lost value associated with foregoing future development.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> Development within the proposed designation is generally expected to be low. Potentially developable land is abundant given the rural nature of most areas. As a result, we assume that purchase of land set-asides will not require significant restrictions on future development.
The average project size is 35 acres.	May <b>overestimate</b> impacts.	<b>Probably minor.</b> This assumed project size represents the low end of expected project sizes. The majority of projects are expected to be larger, based on communications with county planners.
Approximately 11 percent of development projects will require section 7 consultation.	<b>Unknown.</b> May overestimate or underestimate impacts.	<b>Probably minor.</b> The probability that a project will require a Corps permit is likely low, as a result of the hydrology of the area. In all areas of the proposed designation, except Gunnison County, the Corps has not issued permits for development projects during the last five years. Our analysis may therefore overestimate impacts in these areas. In Gunnison County, the number of Corps permits issued is uncertain, but may be higher than the number of consultations forecast in our analysis. In Gunnison County, we may therefore underestimate impacts. To the extent that future projects choose to develop near existing water sources, or if projects receive Federal funding or require rights-of-way on Federal land, the forecast of section 7 consultations may be underestimated.

## CHAPTER 7 | POTENTIAL ECONOMIC IMPACTS TO RENEWABLE ENERGY DEVELOPMENT

210. This chapter provides an analysis of potential economic impacts to renewable energy activities, including wind and geothermal development, associated with sage-grouse conservation. In particular, this chapter considers the potential for conservation efforts or restrictions on leasing within the proposed designation. The chapter proceeds as follows: Section 7.1 first discusses the scope and scale of renewable energy development within the proposed designation. Section 7.2 summarizes existing baseline conservation efforts, and section 7.3 discusses the types of additional conservation efforts that may be requested following the designation of critical habitat. Section 7.4 then presents our analytical approach and estimation of baseline impacts. Section 7.5 presents the estimation of incremental impacts. Finally, section 7.6 summarizes the results, and section 7.7 discusses key uncertainties of the analysis.

### 7.1 SCOPE AND SCALE OF RENEWABLE ENERGY DEVELOPMENT

211. As described in the Proposed Listing Rule, renewable energy development may threaten the sage-grouse and its habitat similarly to oil and gas extraction by degrading, fragmenting, or destroying sage-grouse habitat. Additionally, noise and shadows produced by rotating wind turbine blades may affect the sage-grouse. The extent to which these factors may threaten the sage-grouse are uncertain.<sup>197</sup> The proposed designation – in particular, the Gunnison Basin unit – includes areas identified as having high geothermal development potential.<sup>198</sup> Additionally, the Service notes that interest in wind energy development has increased in the vicinity of the Monticello-Dove Creek unit in recent years.<sup>199</sup> One renewable energy project is currently under construction within the proposed designation. The potential for future geothermal and wind energy development is described in the following sections.

#### 7.1.1 GEOTHERMAL DEVELOPMENT

212. Within the proposed designation, BLM issues geothermal leases for lands under the jurisdiction of its Gunnison and San Luis Valley field offices, which encompass the proposed Gunnison Basin and Poncha Pass units. Geothermal leases may include

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<sup>197</sup> 2013 Proposed Listing Rule. 78 FR 2510.

<sup>198</sup> 2013 Proposed Rule. 78 FR 2560.

<sup>199</sup> 2013 Proposed Listing Rule. 78 FR 2511.

both Federal lands and private lands with Federal mineral ownership. In addition, USFS lands are leased together with BLM lands.<sup>200</sup>

213. Within the Gunnison Basin unit, approximately 4,600 acres of BLM land and 3,800 acres of USFS land are leased for geothermal development. In 2012, the entirety of this area was leased to Double Heart Lodge, LLC.<sup>201</sup> This group is a conservation organization that does not intend to develop the resources.<sup>202</sup> Geothermal leases are issued for 10 years and may be extended for two five-year periods.<sup>203</sup> Therefore, we do not anticipate geothermal development in the Gunnison Basin over the 20-year analysis period. The location of these geothermal leases is shown in Exhibit 7-1.<sup>204</sup>
214. BLM has not yet issued geothermal leases within the Poncha Pass unit. The agency released a final environmental assessment of the proposed leasing program in October 2012, but the amendment to the San Luis Valley field office RMP has not yet been finalized.<sup>205</sup> It is uncertain when BLM may begin to issue leases in this unit.

#### 7.1.2 WIND ENERGY DEVELOPMENT

215. Three wind energy projects are proposed for areas in the vicinity of the proposed designation in San Juan County, Utah.<sup>206</sup> Development of one of these wind projects by Eco-Power Wind Farms, LLC is underway within the occupied portion of the Monticello-Dove Creek unit.<sup>207</sup> The other projects are proposed for areas outside of critical habitat.<sup>208</sup> Although the Eco-Power development will be located on privately owned land, wind projects often require Federal permits, either from the Corps or the Federal Aviation Administration, which has jurisdiction over structures 200 feet tall.<sup>209</sup> In addition, some of the privately owned lands used for this project may be

<sup>200</sup> Bureau of Land Management. Colorado Renewable Energy. Accessed at [http://www.blm.gov/co/st/en/BLM\\_Programs/energy/renewable\\_energy.html](http://www.blm.gov/co/st/en/BLM_Programs/energy/renewable_energy.html) on May 24, 2013.

<sup>201</sup> Bureau of Land Management. Case Recordation. Geothermal Leases Issued. Accessed at [http://www.blm.gov/co/st/en/BLM\\_Programs/oilandgas/oil\\_and\\_gas\\_lease/2012/february\\_9\\_2012\\_lease.html](http://www.blm.gov/co/st/en/BLM_Programs/oilandgas/oil_and_gas_lease/2012/february_9_2012_lease.html) on May 24, 2013.

<sup>202</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 3, 2013.

<sup>203</sup> Bureau of Land Management. Environmental Assessment of Geothermal Lease Nomination, Gunnison County, Colorado. March 2011.

<sup>204</sup> Colorado Bureau of Land Management. February 9, 2012 Oil and Gas Lease Sale. GIS data of geothermal parcels downloaded from [http://www.blm.gov/co/st/en/BLM\\_Programs/oilandgas/oil\\_and\\_gas\\_lease/2012/february\\_9\\_2012\\_lease.html](http://www.blm.gov/co/st/en/BLM_Programs/oilandgas/oil_and_gas_lease/2012/february_9_2012_lease.html) on May 1, 2013.

<sup>205</sup> Colorado Bureau of Land Management. San Luis Valley Field Office Geothermal Leasing. Accessed at [http://www.blm.gov/co/st/en/fo/slvfo/Geothermal\\_Leasing.html](http://www.blm.gov/co/st/en/fo/slvfo/Geothermal_Leasing.html) on May 24, 2013.

<sup>206</sup> Sandberg, N. San Juan County Planner. Personal communication on March 6, 2013.

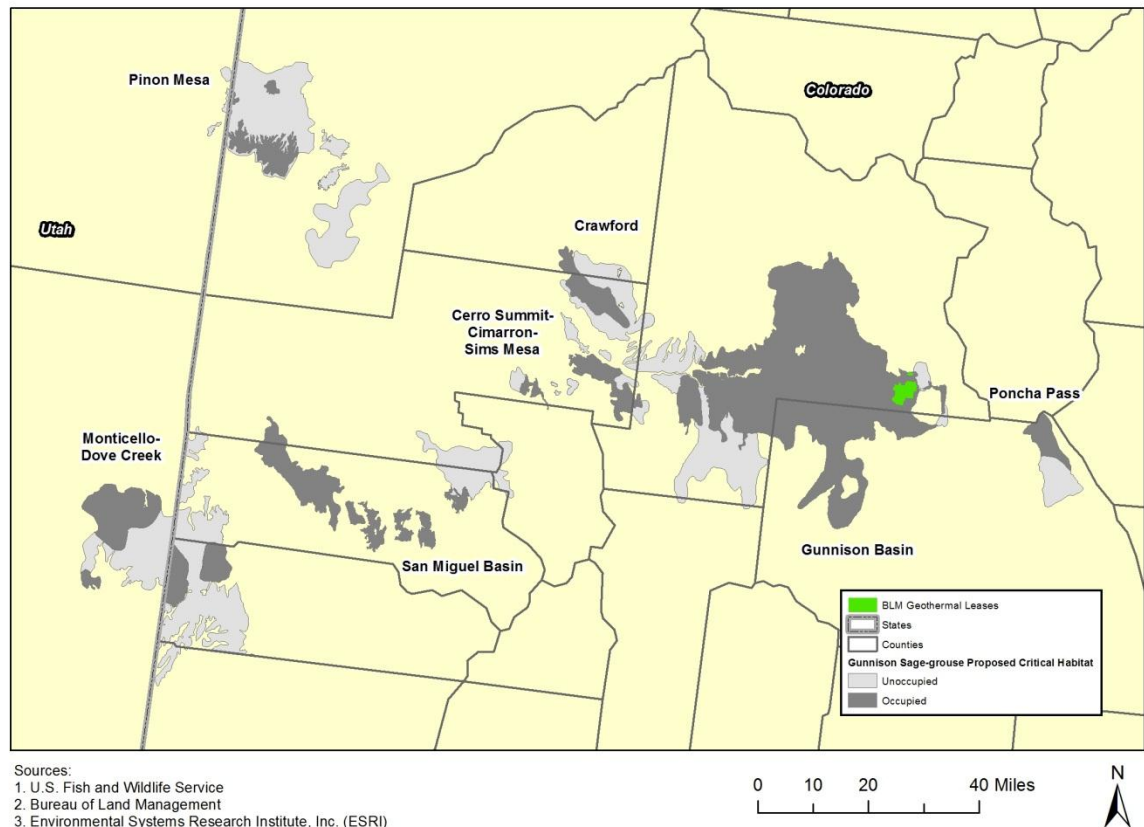
<sup>207</sup> Clarke, Kathleen. Director, Utah Office of the Governor Public Lands Policy Coordination. Public comment submitted on April 2, 2013.

<sup>208</sup> Sandberg, N. San Juan County Planner. Personal communication on May 2, 2013.

<sup>209</sup> American Wind Energy Association. Siting Policy. Federal Aviation Administration. Accessed at <http://www.awea.org/issues/siting/> on May 24, 2013.

enrolled in CRP. Participation in this program, or other similar programs through FSA or NRCS, may require consultation with the Service depending on the restrictions attached to enrollment agreements.<sup>210</sup> No current permits or applications for wind development exist on BLM lands in the proposed critical habitat.<sup>211</sup>

#### EXHIBIT 7-1. GEOTHERMAL LEASES WITHIN PROPOSED CRITICAL HABITAT



### 7.2 EXISTING BASELINE CONSERVATION EFFORTS

216. Existing management strategies may provide some protection to the sage-grouse and its habitat for renewable energy developments located within the proposed designation. In particular, BLM requirements, such as those triggered by the designation of the sage-grouse as a BLM sensitive species, provide protection to the sage-grouse and its habitat for all projects located on BLM lands. BLM management strategies also address geothermal development on leased parcels. Within the Gunnison Basin unit, conservation efforts for geothermal development projects include applying No Surface Occupancy stipulations around active leks and in some other portions of occupied habitat, and avoiding construction or drilling activities

<sup>210</sup> U.S. Fish and Wildlife Service. Personal communication on June 21, 2013.

<sup>211</sup> Bureau of Land Management. Utah Wind Energy. Accessed at [http://www.blm.gov/ut/st/en/prog/energy/wind\\_energy.html](http://www.blm.gov/ut/st/en/prog/energy/wind_energy.html) on May 1, 2013.

during sage-grouse breeding season.<sup>212</sup> Within the Poncha Pass unit, where a geothermal leasing program is proposed but not yet active, proposed conservation efforts include precluding leasing within some areas of sagebrush habitat; applying No Surface Occupancy stipulations to occupied sage-grouse habitat; implementing seasonal restrictions for activity in occupied sage-grouse habitat; and surveying for and monitoring the species and its habitat.<sup>213</sup>

217. We are not aware of specific baseline protections for wind energy development in the Monticello-Dove Creek unit, particularly in the context of development on private land. However, as described above, we expect that future wind energy development within the proposed designation will be minimal.

### **7.3 POTENTIAL INCREMENTAL CONSERVATION EFFORTS**

218. As described in Chapter 2, conservation efforts requested to avoid adverse modification of critical habitat are expected to be similar to those requested to avoid jeopardy to the species. Renewable energy development is not expected to result in significant alteration of habitat; therefore, we do not forecast additional project modifications beyond what would be requested to avoid jeopardy to the species.
219. The Service has noted that wind energy development is most likely to threaten the sage-grouse or its habitat in conjunction with other activities, or if large-scale wind energy developments occur in the future.<sup>214</sup> For the one wind energy project that is underway, potential conservation efforts currently being discussed include re-siting specific turbines or restricting the operation of specific turbines, as necessary, to protect active leks.<sup>215</sup> These types of conservation efforts are assumed to result from the listing of the species, rather than the designation of critical habitat. Any associated costs would therefore be incurred in the baseline. Additionally, these types of conservation efforts may require minor adjustments during the planning stage, but are unlikely to have substantial economic impacts. As a result, we do not quantify costs associated with potential project modifications for wind energy developments due to either the listing of the sage-grouse or the proposed critical habitat designation.

### **7.4 BASELINE IMPACTS**

220. To estimate administrative impacts associated with renewable energy development, we use information on geothermal leasing programs and planned wind projects to develop a section 7 consultation forecast. As noted above, existing geothermal parcels in the Gunnison Basin unit are leased by a conservation group that does not intend to develop the resource. The geothermal leasing program within the Poncha Pass unit may be implemented within the timeframe of this analysis, but we are not

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<sup>212</sup> Bureau of Land Management. Environmental Assessment of Geothermal Lease Nomination, Gunnison County, Colorado. March 2011.

<sup>213</sup> Bureau of Land Management. San Luis Valley Field Office Geothermal Leasing RMP Amendment. Final. October 2012.

<sup>214</sup> U.S. Fish and Wildlife Service. Personal communication on March 21, 2013.

<sup>215</sup> U.S. Fish and Wildlife Service. Personal communication on June 21, 2013.

able to predict when and if future leases will be developed. As a result, we do not forecast any impacts associated with geothermal development. Based on communication with San Juan County and information received in public comments, we forecast costs associated with one wind energy development in the occupied portion of the Monticello-Dove Creek unit. Although this project may not have a Federal nexus for section 7 consultation, we conservatively forecast one formal section 7 consultation in 2013 for the project. As noted by BLM, interest in wind energy development on public lands has increased during recent years.<sup>216</sup> This trend suggests that additional projects may occur within proposed critical habitat in the future. However, information is not available to predict future rates of wind energy development.

221. The Service has suggested that wind energy development is most likely to affect the sage-grouse and its habitat in conjunction with other threats to the species. Recommended conservation efforts are likely to include minor adjustments to turbine siting that can be incorporated during the planning stage, and therefore are unlikely to result in substantial costs to project proponents. As a result, we do not quantify project modifications for wind development projects. Impacts are therefore limited to the administrative effort associated with section 7 consultation.
222. Exhibit 7-2 presents the results of the baseline analysis for renewable energy development. Forecast impacts are limited to the portion of administrative effort to consider jeopardy to the species in one formal section 7 consultation for the Eco-Power wind farm in 2013. Baseline impacts are approximately \$15,000 (present value over 20 years), discounted at seven percent.

**EXHIBIT 7-2. FORECAST BASELINE IMPACTS TO RENEWABLE ENERGY DEVELOPMENT, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$15,000	\$1,300
Piñon Mesa	\$0	\$0
San Miguel Basin	\$0	\$0
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0
Crawford	\$0	\$0
Gunnison Basin	\$0	\$0
Poncha Pass	\$0	\$0
<b>Total</b>	<b>\$15,000</b>	<b>\$1,300</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

<sup>216</sup> Bureau of Land Management. Utah Wind Energy. Accessed at [http://www.blm.gov/ut/st/en/prog/energy/wind\\_energy.html](http://www.blm.gov/ut/st/en/prog/energy/wind_energy.html) on May 1, 2013.

**7.5 INCREMENTAL IMPACTS**

223. We forecast incremental impacts for renewable energy development of approximately \$5,000 (present value over 20 years), discounted at seven percent. Incremental impacts are limited to the administrative effort to consider adverse modification of critical habitat in one formal section 7 consultation for the Eco-Power wind farm in 2013. These results are summarized in Exhibit 7-3.

**EXHIBIT 7-3. FORECAST INCREMENTAL IMPACTS TO RENEWABLE ENERGY DEVELOPMENT, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$5,000	\$440
Piñon Mesa	\$0	\$0
San Miguel Basin	\$0	\$0
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0
Crawford	\$0	\$0
Gunnison Basin	\$0	\$0
Poncha Pass	\$0	\$0
<b>Total</b>	<b>\$5,000</b>	<b>\$440</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**7.6 SUMMARY OF RESULTS**

224. As described above, this analysis forecasts baseline impacts to renewable energy development of \$15,000 and incremental impacts of \$5,000 (present value over 20 years), discounted at seven percent. These impacts are associated with the administrative effort to consider jeopardy to the species and adverse modification of critical habitat in one formal consultation for wind energy development in the Monticello-Dove Creek unit. We do not forecast any impacts associated with project modifications for this wind energy development.

**7.7 KEY UNCERTAINTIES**

225. Exhibit 7-4 summarizes the key assumptions of the analysis of economic impacts to renewable energy development, as well as the potential direction and relative scale of bias introduced by these assumptions.



**EXHIBIT 7-4. KEY ASSUMPTIONS OF THE ANALYSIS OF ECONOMIC IMPACTS TO RENEWABLE ENERGY DEVELOPMENT**

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
BLM geothermal leases in the Gunnison Basin unit will not be developed over the time frame of the analysis.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> Existing leases have been sold to a conservation group. These leases are likely to extend through at least 2022 and potentially through 2032. Therefore, we assume it is unlikely that geothermal development will occur during the analysis period.
BLM geothermal leases in the Poncha Pass unit will not be developed over the time frame of the analysis.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> BLM is in the process of developing a geothermal leasing amendment for the Poncha Pass unit. Because of uncertainty over when this amendment will be complete, when parcels will be leased, and the location of potential leases, we are not able to forecast impacts within the Poncha Pass unit. To the extent that geothermal leases are sold and developed within the proposed designation during the period of analysis, this assumption may lead us to underestimate impacts.
Project modifications for development of the Eco-Power wind energy development in the Monticello-Dove Creek unit will not result in economic impacts.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> The types of project modifications being discussed for this development include re-siting specific turbines and restricting operation of specific turbines when necessary to protect active leks. These types of conservation efforts are unlikely to result in substantial economic impacts if they are incorporated during the planning stage of the project. Therefore, we assume that impacts associated with conservation efforts for wind energy developments are unlikely. To the extent that impacts occur, those impacts are considered part of the baseline.
Additional wind energy projects will not be developed within the proposed designation over the period of analysis.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> To the extent that future wind energy development occurs within the proposed designation in the future, this analysis will underestimate impacts. This assumption affects only the forecast consultation rate since no project modifications are expected.

## CHAPTER 8 | POTENTIAL ECONOMIC IMPACTS TO RECREATION AND TRANSPORTATION ACTIVITIES

226. This chapter provides an analysis of potential economic impacts to recreation and transportation activities associated with sage-grouse conservation. In particular, this chapter considers the potential for restrictions to recreational activity and transportation construction within the proposed designation. The chapter proceeds as follows: Section 8.1 first discusses the scope and scale of recreation and transportation activities within the proposed designation. Section 8.2 summarizes existing baseline conservation efforts, and section 8.3 discusses the types of additional conservation efforts that may be requested following the designation of critical habitat. Section 8.4 then presents our analytical approach and estimation of baseline impacts. Section 8.5 presents the estimation of incremental impacts. Finally, section 8.6 summarizes the results, and section 8.7 discusses key uncertainties of the analysis.

### 8.1 SCOPE AND SCALE OF RECREATION AND TRANSPORTATION ACTIVITIES

227. As described in the Proposed Listing Rule, recreational use of roads and trails and land-clearing activities for the construction of roads may affect the sage-grouse and its habitat by degrading, fragmenting, or destroying sagebrush habitat.<sup>217</sup> The proposed designation is predominantly rural, and encompasses hundreds of miles of recreational trails and roads. Recreational use of trails is expected to increase over the 20-year period of analysis.<sup>218</sup> In addition, the proposed designation includes approximately 290 miles of state and Federal highways, as shown in Exhibit 8-1. Of these highways, approximately 136 miles are located in occupied habitat, and 108 miles are located in unoccupied habitat. According to the Colorado and Utah Departments of Transportation, transportation volume and construction of new roads in these areas have not increased significantly over the past 10 years. Increases over the next 20 years are uncertain.<sup>219, 220</sup> As such, most transportation projects in this area are related to maintenance, reconstruction, or creation of access roads to private properties.

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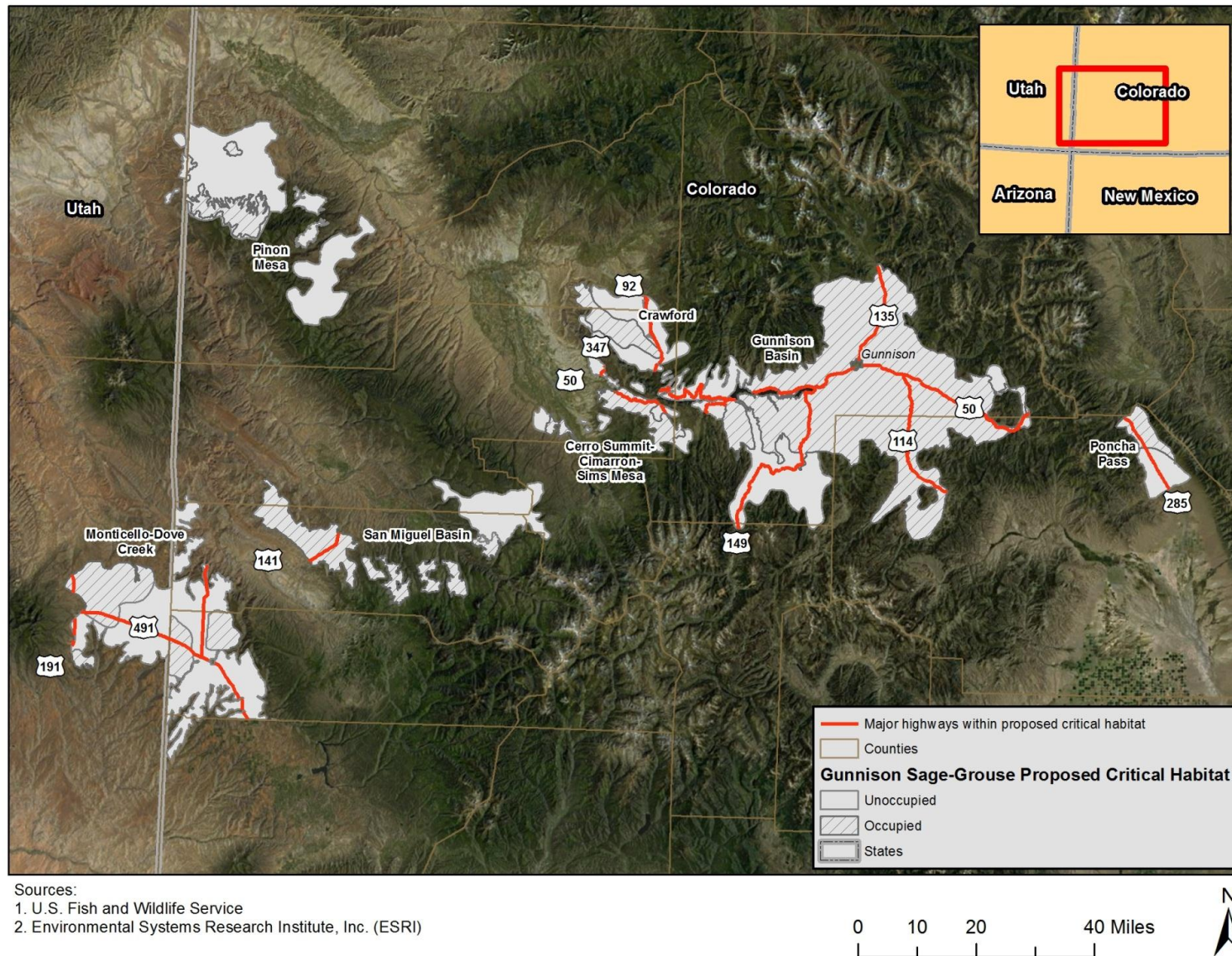
<sup>217</sup> 2013 Proposed Listing Rule. 78 FR 2498-2499

<sup>218</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 15, 2013.

<sup>219</sup> Alexander, Ronald. Residential engineer, Colorado Department of Transportation. Personal communication on April 9, 2013.

<sup>220</sup> Weston, Brandon. Environmental services director. Utah Department of Transportation. Personal communication on April 24, 2013.

EXHIBIT 8-1. MAJOR EXISTING TRANSPORTATION INFRASTRUCTURE IN PROPOSED CRITICAL HABITAT



228. Consultation is anticipated for recreational activities, such as trail maintenance, rerouting, or usage, occurring on NPS, BLM, and USFS lands. Consultation is anticipated for transportation projects that receive funding from or participate in Federal programs through the U.S. Federal Highway Administration. This chapter focuses on impacts to recreation and transportation activities on BLM, NPS, and USFS lands and other transportation projects with Federal funding.

## **8.2 EXISTING BASELINE CONSERVATION EFFORTS**

229. According to the Proposed Rule, some transportation and recreation activities threaten the sage-grouse and its habitat. Both motorized (i.e., using automobiles or off-highway vehicles) and non-motorized (i.e., biking or hiking) activities may disturb or fragment sage-grouse habitat or cause other disturbance to the species. However, recreation and transportation activities can minimize these threats by incorporating the following conservation efforts, among others:
- Seasonal closures in sage-grouse habitat;
  - Siting construction or infrastructure projects within existing development footprints; and
  - Reclamation of disturbed areas.
230. On Federal lands, management of recreation activities is left to the discretion of the Federal agencies responsible for permitting recreation. Reductions in impacts from recreation activities to the sage-grouse and its habitat have been realized through restrictions on new routes in sage-grouse occupied habitats, seasonal closures of biologically sensitive areas, and limitations on cross-country travel within habitats.<sup>221,222,223</sup>
231. Management of transportation activities on Federal lands is implemented similarly. Federal agencies responsible for permitting transportation projects may impose restrictions to provide protection to threatened and endangered or sensitive species, such as the sage-grouse. Additionally, State Departments of Transportation are responsible for the management of federally funded transportation projects that traverse privately owned lands within habitat of any threatened or endangered species. State Departments of Transportation conduct environmental analyses prior to reconstruction, repair, or rehabilitation work. In conjunction with these analyses, the Departments consider and mitigate effects to sensitive or threatened species.<sup>224</sup> Conservation efforts for transportation projects that may affect the sage-grouse or its habitat typically include timing restrictions or reclamation of disturbed areas.<sup>225, 226</sup>

<sup>221</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 3, 2013.

<sup>222</sup> Steas, Clay. Biologist, US Department of Agriculture Forest Service. Personal communication on April 22, 2013.

<sup>223</sup> Childers, Theresa. Wildlife biologist. National Park Service. Personal communication on April 22, 2013.

<sup>224</sup> Alexander, Ronald. Residential engineer, Colorado Department of Transportation. Personal communication on April 9, 2013.

<sup>225</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 15, 2013.



232. Within the proposed designation, numerous existing management strategies consider the effect of recreation and transportation activities on the sage-grouse and its habitat. These are summarized below.

#### 8.2.1 GUNNISON BASIN CCA

233. As described in Chapter 3, the Gunnison Basin Sage-Grouse Strategic Committee is in the process of developing a CCA for the Gunnison Basin unit. The CCA will require conservation efforts for recreation and transportation projects on nearly 400,000 acres of federally managed lands that are occupied by the sage-grouse. BLM, USFS, and NPS are all expected to sign the CCA. The Service expects that all Federal agencies involved in the CCA will pursue a single conference opinion to address potential impacts of the CCA on the sage-grouse and its habitat.<sup>227</sup> When finalized, the CCA will cover recreation and transportation activities management on Federal lands in the Gunnison Basin unit.
234. The CCA recognizes the importance of establishing recreation and transportation management strategies for federally managed portions within sage-grouse habitat. Exhibit 8-2 outlines the conservation efforts expected to be required under the CCA.

#### EXHIBIT 8-2. MANAGEMENT REQUIREMENTS FOR RECREATION AND TRANSPORTATION IN DRAFT CCA

ROAD AND TRAIL TYPE	HABITAT DESIGNATION	ACTIVITY/ APPLICANT	REQUIREMENTS
Motorized Roads and Trails	Tier 1	Realignment	<ul style="list-style-type: none"> <li>Decommissioned road and trail segments will be reclaimed.</li> <li>Roads are anticipated to conserve or enhance sage-grouse habitat.</li> <li>Standard minimization techniques are applied (i.e., seasonal exclusions, siting and location requirements, and reclamation requirements).</li> </ul>
		Private applicants	<ul style="list-style-type: none"> <li>Demonstration that the proposed route is the only reasonable and feasible option with no alternative.</li> <li>Offsite/compensatory mitigation efforts at a ratio of &gt;1 acre reclaimed: 1 acre disturbed.</li> <li>Standard minimization techniques are applied.</li> </ul>
	Tier 2	New routes	<ul style="list-style-type: none"> <li>Offsite mitigation at a ratio of 1 acre reclaimed: 1 acre disturbed.</li> <li>Standard minimization techniques are applied.</li> </ul>

<sup>226</sup> Alexander, Ronald. Residential engineer, Colorado Department of Transportation. Personal communication on April 9, 2013.

<sup>227</sup> 2013 Proposed Rule, 78 FR 2515.

ROAD AND TRAIL TYPE	HABITAT DESIGNATION	ACTIVITY/ APPLICANT	REQUIREMENTS
Unmotorized Trails	Tier 1	Realignment	<ul style="list-style-type: none"> <li>Realignment conserves or enhances sage-grouse habitat or other important natural resource (e.g., riparian areas).</li> <li>Decommissioned trail segments will be reclaimed.</li> <li>Standard minimization measures are applied.</li> </ul>
		New routes	<ul style="list-style-type: none"> <li>New routes would consolidate existing designated and user-created routes.</li> <li>“Consolidation” accomplished by decommissioning and reclaiming the replaced routes at a ratio of &gt;1 acre reclaimed: 1 acre disturbed.</li> <li>Signs are installed to ensure pets are leashed on route during identified critical biological periods, with exception of permitted outfitting activities.</li> <li>Standard minimization measures are applied.</li> </ul>
	Tier 2	New routes	<ul style="list-style-type: none"> <li>Offsite mitigation at a ratio of 1 acre reclaimed: 1 acre disturbed.</li> <li>Standard minimization techniques are applied.</li> </ul>
<b>Notes:</b> Tier 1 lands - roughly 60 percent of occupied habitat in Gunnison Basin- characterized by two or more overlapping seasonable habitats and minimal existing permanent development Tier 2 lands - roughly 40 percent of occupied habitat in Gunnison Basin - represents fragmented areas on the landscape			

### 8.2.2 BLM RESOURCE MANAGEMENT PLANS

235. The sage-grouse was designated as a BLM Sensitive Species in 2000. This designation provides some protection to the sage-grouse and its habitat. In particular, each field office develops a RMP that is required to address sensitive species.<sup>228</sup>
236. In accordance with these RMPs, changes to recreation and travel management have occurred for the sage-grouse over the past 10 years as plans have been renewed. According to communication with BLM, the agency has already implemented restrictions in many areas. These restrictions include changes to allowable seasons of use and restrictions on surface occupancy, surface disturbing, and disruptive activities.<sup>229</sup>

<sup>228</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013. (10)

<sup>229</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 29, 2013.

### 8.2.3 BLM TRAVEL MANAGEMENT PLANS

237. BLM develops travel management plans (TMP) to assess and determine adequate usage of roads and other travel occurring within its jurisdiction. These TMPs also consider conservation of sensitive species. Each field office has developed a TMP that addresses conservation for the sage-grouse.<sup>230</sup>
238. In accordance with these TMPs, many changes to travel management have already occurred. BLM adjusts management strategies based on conservation needs of individual field offices.<sup>231</sup> According to communication with BLM, the agency has already implemented restrictions and travel changes for sage-grouse conservation. These changes include seasonal use restrictions and closure of some roads and trails.<sup>232</sup>

### 8.3 POTENTIAL INCREMENTAL CONSERVATION EFFORTS

239. As described in Chapter 2, conservation efforts requested to avoid adverse modification of critical habitat are expected to be similar to those requested to avoid jeopardy to the species. Transportation and recreation activities are not expected to result in significant alteration of habitat; therefore, we do not forecast additional project modifications beyond what would be requested to avoid jeopardy to the species. According to BLM, NPS, and USFS, the agencies have already implemented some seasonal restrictions and trail closures within the proposed designation in recent years.<sup>233, 234, 235</sup> This analysis assumes that these types of conservation efforts will result in impacts to both users and managers. Our conversations with BLM, NPS, and USFS suggest that recreation conservation efforts are not anticipated to broadly affect recreation activity in these areas (i.e., the users are able to use other trails or these seasonal closures are currently already observed) and therefore the analysis focuses on quantifying costs associated with these restrictions on Federal land managers.

### 8.4 BASELINE IMPACTS

240. Potential impacts to recreation and transportation quantified in this chapter consist of:
- **Additional monitoring and management requirements.** Additional monitoring and management requirements are assumed to occur across all public lands within the proposed critical habitat. Because the additional monitoring and management requirements are likely to result from the listing of the species, they are considered baseline impacts. Some portion of monitoring and management effort may be associated with considering

<sup>230</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013. (12)

<sup>231</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 3, 2013.

<sup>232</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 29, 2013.

<sup>233</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 3, 2013.

<sup>234</sup> Childers, Theresa. Wildlife biologist. National Park Service. Personal communication on April 22, 2013.

<sup>235</sup> Steas, Clay. Biologist, US Department of Agriculture Forest Service. Personal communication on April 22, 2013.



impacts to critical habitat beyond impacts to the species, but this portion is likely minimal compared to the effort to consider impacts to the species. We are unable to separate the incremental portion of management effort, and therefore assign all costs to the baseline. This assumption may result in a minor underestimation of incremental impacts.

- **Administrative costs.** These impacts consist of the administrative effort associated with programmatic and informal section 7 consultations to address recreation and transportation activities on public lands and for projects identified by the Colorado Department of Transportation (CDOT). Costs associated with jeopardy analyses in occupied habitat are considered baseline impacts; additional costs associated with adverse modification analyses in these areas, as well as all costs of consultation in unoccupied habitat, are considered incremental impacts. Section 7 programmatic consultations are assumed to occur at the field office level.<sup>236</sup> CDOT section 7 consultations are assumed to be conducted informally at the project level.<sup>237</sup>

241. The remainder of this section discusses our approach to quantifying these categories of impacts in more detail.

#### 8.4.1 ADDITIONAL MONITORING AND MANAGEMENT REQUIREMENTS

242. USFS, BLM, and NPS currently consider the sage-grouse when monitoring and managing recreation and transportation projects on public lands. Additional conservation efforts – such as those that will be required by the CCA – may require additional monitoring and management effort from the agencies. USFS anticipates that the additional monitoring and management requirements related to the listing and designation of critical habitat for the sage-grouse will require additional effort equivalent to one full-time staff member.<sup>238</sup> BLM also believes that an increase in workload for each field office is likely, and the assumption of costs associated with an additional staff member may be reasonable over the long term. Due to budgetary constraints, BLM does not anticipate adding staff in the short term (three to four years). Instead, BLM suggested that the more likely short-term impact could be the cost of additional time delay incurred by recreation and transportation projects.<sup>239</sup> Time delays would result in opportunity costs associated with not completing projects during the period of delay. Due to uncertainty over the extent to which delays be occur over the short term, this analysis assumes that additional monitoring and management costs associated with one staff member will be incurred consistently during the 20-year analysis period. While some portion of the additional management effort may be attributed to the designation of critical habitat, we assume that the

<sup>236</sup> Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 30, 2013.

<sup>237</sup> Lawler, Mark. Threatened and endangered species biologist. Colorado Department of Transportation. Personal communication on April 26, 2013.

<sup>238</sup> Steas, Clay. Biologist, US Department of Agriculture Forest Service. Personal communication on April 22, 2013.

<sup>239</sup> U.S. Fish and Wildlife Service and BLM Colorado State Office. Personal communication on May 20, 2013.

effort is primarily associated with the listing of the species.<sup>240</sup> Thus, this additional cost is considered a baseline impact for both recreation and transportation activities across all field offices within the proposed designation. By not monetizing opportunity costs associated with deferred recreation and transportation projects, this analysis may understate impacts.

#### 8.4.2 ANALYTICAL APPROACH AND RESULTS

243. To estimate costs associated with recreation and transportation projects, we contacted relevant Federal and state agencies to identify future projects and consultations that may consider the sage-grouse. This included speaking with representatives from NPS, BLM, and USFS, as well as the Utah and Colorado Departments of Transportation. The Service and BLM anticipate one rangewide programmatic consultation for all recreation activities, and one programmatic consultation on transportation activities for each field office.<sup>241</sup> Although the expected conference opinion on the Gunnison Basin CCA may eliminate the need for some of these consultations, we conservatively forecast a single programmatic consultation for both transportation and recreation activities for both NPS and USFS.<sup>242</sup> For transportation projects receiving Federal funding but not located on Federal lands, CDOT Region 5 estimates one additional project per month, equally allocated to the Monticello-Dove Creek and Poncha Pass units, that will result in informal section 7 consultation.<sup>243</sup> CDOT Region 3 estimates an additional six projects per year, equally allocated between the Cerro Summit-Cimarron-Sims Mesa, Crawford, and Gunnison Basin units, that will result in informal section 7 consultation.<sup>244</sup> While CDOT project schedules can be highly variable and dependent on receipt of funding, this estimate represents the best available forecast of future consultations.<sup>245</sup> The Utah Department of Transportation does not anticipate any future transportation projects requiring consultation with the Service.<sup>246</sup>
244. To estimate administrative impacts for recreation activities, we forecast one programmatic consultation for USFS and NPS and one programmatic consultation for all BLM offices within the proposed area. Specifically, this analysis assumes

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<sup>240</sup> Steas, Clay. Biologist, US Department of Agriculture Forest Service. Personal communication on April 22, 2013.

<sup>241</sup> U.S. Fish and Wildlife Service and BLM Colorado State Office. Personal communication on May 20, 2013.

<sup>242</sup> Gunnison Basin Sage-Grouse Strategic Committee. 2013. Draft Candidate Conservation Agreement For the Gunnison Sage-grouse, *Centrocercus minimus*, Gunnison Basin Population.

<sup>243</sup> Lawler, Mark. Threatened and endangered species biologist. Colorado Department of Transportation. Personal communication on April 26, 2013.

<sup>244</sup> Vanderhoof, Michael. Region planning and environmental manager. Colorado Department of Transportation. Personal communication on May 29, 2013.

<sup>245</sup> While it is possible that some forecast informal consultations may conclude formally due to project requirements, historical data and communications with CDOT representatives suggest that the majority, if not all projects, will be concluded informally.

<sup>246</sup> Weston, Brandon. Environmental services director. Utah Department of Transportation. Personal communication on April 24, 2013.

three programmatic section 7 consultations in 2013 for recreation activities occurring within the jurisdiction of the following field offices:

- Grand Junction BLM;
- Gunnison BLM;
- San Luis Valley BLM;
- Tres Rios BLM;
- Uncompahgre BLM;
- Moab BLM;
- Monticello BLM;
- Crawford National Park Lands; and
- GMUG National Forests.

Costs of these three consultations are allocated to critical habitat units proportionally based on the percent of each field office's administrative area overlapping each unit. We assume that all consultations will address both jeopardy to the species and adverse modification of critical habitat.

245. To estimate administrative impacts associated with transportation on Federal lands, we assume one programmatic consultation for each of the seven Colorado field offices. Thus, we estimate a total of 9 programmatic consultations for BLM, NPS, and USFS field offices.
246. Exhibits 8-3 and 8-4 present the results of the baseline analysis for recreation and transportation activities. These results include costs associated with additional monitoring and management, as well as programmatic and informal consultations. We forecast baseline impacts associated with recreation activities of approximately \$1.6 million (present value over 20 years), discounted at seven percent. For transportation activities, we forecast baseline impacts of approximately \$6.1 million (present value over 20 years), discounted at seven percent.

**EXHIBIT 8-3. FORECAST BASELINE IMPACTS TO RECREATION ACTIVITIES, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$110,000	\$10,000
Piñon Mesa	\$280,000	\$25,000
San Miguel Basin	\$100,000	\$8,900
Cerro Summit-Cimarron-Sims Mesa	\$18,000	\$1,600
Crawford	\$580,000	\$52,000
Gunnison Basin	\$390,000	\$34,000
Poncha Pass	\$75,000	\$6,600
<b>Total</b>	<b>\$1,600,000</b>	<b>\$140,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT 8-4. FORECAST BASELINE IMPACTS TO TRANSPORTATION ACTIVITIES, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$1,300,000	\$110,000
Piñon Mesa	\$1,200,000	\$100,000
San Miguel Basin	\$320,000	\$28,000
Cerro Summit-Cimarron-Sims Mesa	\$280,000	\$24,000
Crawford	\$1,600,000	\$140,000
Gunnison Basin	\$1,000,000	\$88,000
Poncha Pass	\$520,000	\$46,000
<b>Total</b>	<b>\$6,100,000</b>	<b>\$540,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**8.5 INCREMENTAL IMPACTS**

247. To estimate incremental impacts, we apply the same methodology described above. We consider additional monitoring and management costs to be part of the baseline. As a result, we forecast only incremental administrative costs associated with programmatic and informal consultations for transportation and recreation activities. We forecast incremental impacts for recreation activities of approximately \$27,000

(present value over 20 years), discounted at seven percent. We forecast incremental impacts for transportation activities of approximately \$1.3 million (present value over 20 years), discounted at seven percent. Incremental impacts associated with transportation and recreation activities are summarized in Exhibits 8-5 and 8-6.

**EXHIBIT 8-5. FORECAST INCREMENTAL IMPACTS TO RECREATION ACTIVITIES, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$2,000	\$170
Piñon Mesa	\$4,900	\$430
San Miguel Basin	\$1,700	\$150
Cerro Summit-Cimarron-Sims Mesa	\$320	\$28
Crawford	\$10,000	\$890
Gunnison Basin	\$6,800	\$600
Poncha Pass	\$1,300	\$110
<b>Total</b>	<b>\$27,000</b>	<b>\$2,400</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT 8-6. FORECAST INCREMENTAL IMPACTS TO TRANSPORTATION ACTIVITIES, 2013-2032 (2012\$, 7% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$460,000	\$40,000
Piñon Mesa	\$20,000	\$1,800
San Miguel Basin	\$5,600	\$490
Cerro Summit-Cimarron-Sims Mesa	\$84,000	\$7,400
Crawford	\$640,000	\$56,000
Gunnison Basin	\$92,000	\$8,100
Poncha Pass	\$9,000	\$800
<b>Total</b>	<b>\$1,300,000</b>	<b>\$120,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**8.6 SUMMARY OF RESULTS**

248. This analysis forecasts baseline impacts to recreation activities of \$1.6 million (present value over 20 years), discounted at seven percent. Approximately \$1.5 million of these impacts are associated with additional monitoring and management due to the listing of the sage-grouse. This analysis forecasts incremental impacts of \$27,000 (present value over 20 years) associated with the administrative effort to consider adverse modification of critical habitat in programmatic consultations. These results are described above.
249. The analysis forecasts baseline impacts to transportation activities of \$6.1 million (present value over 20 years), discounted at seven percent. Approximately \$4.45 million of these impacts are associated with additional monitoring and management due to the listing of the sage-grouse. This analysis forecasts incremental impacts of \$1.3 million (present value over 20 years) associated with the administrative effort to consider adverse modification of critical habitat in programmatic and informal consultations. These results are summarized above.

**8.7 KEY UNCERTAINTIES**

250. Exhibit 8-7 summarizes the key assumptions of the analysis of economic impacts to transportation and recreation activities, as well as the potential direction and relative scale of bias introduced by these assumptions.

**EXHIBIT 8-7. KEY ASSUMPTIONS OF THE ANALYSIS OF ECONOMIC IMPACTS TO  
TRANSPORTATION AND RECREATION ACTIVITIES**

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
NPS and USFS will participate in one programmatic consultation each for both transportation and recreation activities.	May <b>overestimate</b> impacts.	<b>Probably minor.</b> NPS and USFS are signatories to the Gunnison Sage-Grouse CCA for the Gunnison Basin, which is expected to complete a conference opinion with the Service. If approved, the CCA will cover both recreation and transportation activities in the Gunnison Basin. Our assumption would therefore overestimate potential impacts.
Additional monitoring and management will result in costs equivalent to the addition of one staff member per field office for transportation and recreation activities together. This cost will be incurred in each year of the analysis.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> BLM suggests that additional monitoring and management costs will occur due to the listing of the species. However, BLM may not hire an additional staff member in the short term. In subsequent years, this assumption is likely to be accurate. BLM notes that time delays may occur until additional staff are hired. While our assumption may overstate management costs in years when additional staff are not hired, potential opportunity costs of delayed recreation and transportation projects could lead us to understate impacts depending on the number of projects delayed and the extent of delays.
Additional monitoring and management costs result from the listing of the species and not the designation of critical habitat.	May <b>underestimate</b> impacts.	<b>Probably minor.</b> Although some portion of this cost may be attributed to consideration of critical habitat beyond consideration of impacts to the species, this portion is likely to be minimal, and will not affect total estimates of coextensive impacts.



**CHAPTER 9 | POTENTIAL ECONOMIC BENEFITS**

251. The prior chapters of this report describe the types of conservation efforts (e.g., project modifications) likely to be undertaken due to the listing of the sage-grouse as an endangered species under the Act and the designation of sage-grouse critical habitat. The baseline and incremental costs of these conservation efforts are detailed in Chapters 3 through 8 of this report. Although 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, this chapter discusses the potential benefits resulting from these conservation efforts. The chapter first provides a qualitative description of the potential categories of benefits resulting from the listing and the designation, and indicates in which units such benefits may occur. The chapter then introduces the economic methods used to estimate benefits and the availability of existing literature to support valuation in the context of this rulemaking.

### SUMMARY OF POTENTIAL BENEFITS

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. Information on the incremental change in expected conservation of the sage-grouse is not available. However, this chapter provides a description of the categories of potential benefits expected to result from the listing of the species and proposed critical habitat designation. We also review existing economic literature regarding use and non-use values for the sage-grouse and other avian species. These studies, summarized below, provide context for the potential valuation of conservation benefits.

#### Gunnison sage-grouse

- Literature specific to the sage-grouse is not available. We identify two studies that estimate use and non-use values of the greater sage-grouse, a related species.
  - Loft (1998) surveyed mule deer, pronghorn antelope, and greater sage-grouse hunters in northeastern California to determine economic contributions to the region's economy. Loft estimates an economic contribution of approximately \$91 per hunter, or \$37,000 over the two-day hunting period for the greater sage-grouse.
  - van Kooten and Eiswerth (2007) incorporate a biological growth function into a contingent valuation model. The application of the model estimates the economic value of the greater sage-grouse to be \$81.7 million across seven states.

#### Other avian species

- Additional studies address use and non-use values associated with other avian species.
  - The public may derive some benefit from viewing the sage-grouse. The Service completed a comprehensive bird watching study as an addendum to a 2006 wildlife study. The Service estimates the net annual economic contribution of bird watching in the U.S. to be \$35.7 billion. The study does not disaggregate this value by species.
  - The public may also hold recreational use values associated with the sage-grouse. One study estimates regional economic contributions of recreation associated with shorebirds in Delaware Bay of \$67-91 per household for a day trip, or \$202-430 per household for an overnight trip. Another study estimates willingness-to-pay for the prevention of deaths of non-endangered migratory birds in oil-filled ponds of \$80 per household. These studies address bird populations in general.
  - Another study estimates the economic benefit of critical habitat designation for the Mexican spotted owl to be \$55 per household. Applying this estimate of benefits to the sage-grouse may not be appropriate given differences in the species and their habitats.

### 9.1 POTENTIAL BENEFITS OF SAGE-GROUSE CONSERVATION

252. The primary intended benefit of listing a species and designating critical habitat is to ensure the long-term conservation of the species.<sup>247</sup> Various economic benefits, measured in terms of social welfare or regional economic performance, may result from conservation efforts. The benefits can be placed into two categories: (1) those associated with the primary goal of species conservation (i.e. direct benefits), and (2) those additional beneficial services that derive from conservation efforts but are not the purpose of the Act (i.e., ancillary benefits, such as reducing water treatment costs as result of controlling pollution within critical habitat).
253. Because the purpose of the Act is to provide for the conservation of endangered and threatened species, the benefits of actions taken under the Act are often measured in terms of the value placed by the public on species preservation (e.g., avoidance of extinction, and/or increase in a species' population). Such social welfare values may reflect both use and non-use values for the species. Use values derive from a direct use for a species, such as commercial harvesting or recreational wildlife-viewing opportunities. Non-use values are not derived from direct use of the species, but instead reflect the utility the public derives from knowledge that a species continues to exist (e.g., existence or bequest values).
254. As a result of actions taken to preserve endangered and threatened species, such as habitat management, various other benefits may accrue to the public. Conservation efforts may result in improved environmental quality, which in turn may have collateral human health or recreational use benefits. In addition, conservation efforts undertaken for the benefit of a threatened or endangered species may enhance shared habitat for other wildlife. Such benefits may result from project modifications, or may be collateral to such actions. For example, a section 7 consultation may result in decreased livestock grazing within critical habitat. This reduction in grazing may benefit water quality, and may also provide collateral benefits of preserving habitat for other species occupying these areas.
255. This section qualitatively describes the categories of benefits that may result from sage-grouse conservation efforts within the proposed designation. Exhibit 9-1 summarizes potential benefits associated with the specific sage-grouse conservation efforts described in Chapters 3 through 8 of this report. The first column summarizes conservation efforts by land use activity. The second column identifies the potential ancillary benefits that may result from implementation of these conservation efforts. A description of these benefits is provided below. The final column of the exhibit identifies the units where potential baseline and incremental benefits may occur.
256. The categories of economic benefit that may derive from conservation efforts for the sage-grouse described in this report include:

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<sup>247</sup> The term "conservation" means "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary." (16 U.S.C. 1532)

- **Improved water quality:** Implementation of irrigation systems and reduction in the intensity and pattern of grazing may reduce adverse impacts to downstream water quality. Improved water quality may reduce water treatment costs and result in human or ecological health benefits.
- **Property value benefits:** Open space preservation or decreased density of development resulting from sage-grouse conservation may increase adjacent or nearby property values.
- **Enhanced recreational experiences:** Recreators may derive benefit from open space preservation or enhanced views.
- **Educational benefits:** Surveying and monitoring of project sites for the sage-grouse confers educational benefits by generating more information about the species and where populations exist. This knowledge could help direct future conservation efforts.
- **Public safety benefits:** The addition of wildfire breaks in areas near or within sage-grouse habitat may result in a reduction of wildfires and associated property damage.

257. In addition to these categories, all of the conservation efforts described in Exhibit 9-1 are related to the broader conservation and recovery of the species and thus may generate use and non-use values. Moreover, many of the conservation efforts undertaken for the sage-grouse may result in improvements to ecosystem health for other coexisting species, including domestic species such as livestock. The maintenance or enhancement of use and non-use values for these other species, or for general biodiversity, may also result from conservation efforts for the sage-grouse.
258. All proposed units include both occupied and unoccupied habitat. As discussed in Chapter 2, conservation efforts for projects located in occupied habitat are assumed to be implemented due to the listing of the species, generating baseline costs and benefits. Conservation efforts for projects located in unoccupied habitat are assumed to be implemented due to the critical habitat designation. Associated costs and benefits are therefore considered incremental.

## EXHIBIT 9-1. CONSERVATION EFFORTS FOR THE SAGE-GROUSE AND ASSOCIATED BENEFITS

CONSERVATION EFFORT	POTENTIAL BENEFITS	ASSOCIATED UNITS	
		BASELINE BENEFIT	INCREMENTAL BENEFIT
LIVESTOCK GRAZING			
Reduction in the intensity of grazing activity (reduced AUMs)	<ul style="list-style-type: none"><li>Improved water quality</li><li>Ecosystem health for coexisting species</li></ul>	Monticello-Dove Creek, Piñon Mesa, San Miguel Basin, Cerro Summit-Cimarron-Sims Mesa, Crawford, Gunnison Basin, Poncha Pass	Monticello-Dove Creek, Piñon Mesa, San Miguel Basin, Cerro Summit-Cimarron-Sims Mesa, Crawford, Gunnison Basin, Poncha Pass
Grazing pattern changes (e.g., seasonal grazing restriction; rotational grazing)	<ul style="list-style-type: none"><li>Improved water quality</li><li>Ecosystem health for coexisting species</li></ul>		
AGRICULTURE AND WATER MANAGEMENT			
Site-specific grazing plans to enhance plant communities in habitat	<ul style="list-style-type: none"><li>Enhanced recreational experience</li><li>Improved water quality</li><li>Ecosystem health for coexisting species</li></ul>	Monticello-Dove Creek, Piñon Mesa, San Miguel Basin, Cerro Summit-Cimarron-Sims Mesa, Crawford, Gunnison Basin, Poncha Pass	None
Adopting timing guidelines for removal of forage crops	<ul style="list-style-type: none"><li>Ecosystem health for coexisting species</li></ul>		
Removal of conifers and plant debris	<ul style="list-style-type: none"><li>Enhanced recreational experience</li><li>Decreased threat of wildfire</li></ul>		
Establishment of fire breaks	<ul style="list-style-type: none"><li>Decreased threat of wildfire</li></ul>		
Establishment of plant covers	<ul style="list-style-type: none"><li>Enhanced recreational experience</li><li>Ecosystem health for coexisting species</li></ul>		
Cultivation of pasture and hay to reduce grazing of sagebrush habitat	<ul style="list-style-type: none"><li>Ecosystem health for coexisting species</li></ul>		
Establish fixed routes of access roads for vehicular travel	<ul style="list-style-type: none"><li>Improved water quality via reduced erosion</li><li>Ecosystem health for coexisting species</li></ul>		
Implementation of irrigation systems	<ul style="list-style-type: none"><li>Improved water quality</li></ul>		
MINERAL AND FOSSIL FUEL EXTRACTION			
Habitat avoidance	<ul style="list-style-type: none"><li>Water quality benefits</li><li>Property value benefits</li><li>Ecosystem health for coexisting species</li></ul>	Monticello-Dove Creek, San Miguel Basin	None
Timing restrictions for specific activities	<ul style="list-style-type: none"><li>Ecosystem health for coexisting species</li></ul>		

CONSERVATION EFFORT	POTENTIAL BENEFITS	ASSOCIATED UNITS	
		BASELINE BENEFIT	INCREMENTAL BENEFIT
Restoration and reclamation of habitat	<ul style="list-style-type: none"><li>• Property value benefits</li><li>• Improved water quality</li><li>• Ecosystem health for coexisting species</li></ul>		
RESIDENTIAL AND RELATED DEVELOPMENT			
Purchase of land set asides for the purpose of creation of conservation easements	<ul style="list-style-type: none"><li>• Improved water quality</li><li>• Property value benefits</li><li>• Enhanced recreational experience</li><li>• Ecosystem health for coexisting species</li></ul>	Monticello-Dove Creek, Piñon Mesa, San Miguel Basin, Cerro Summit-Cimarron-Sims Mesa, Crawford, Gunnison Basin, Poncha Pass	Monticello-Dove Creek, Piñon Mesa, San Miguel Basin, Cerro Summit-Cimarron-Sims Mesa, Crawford, Gunnison Basin, Poncha Pass
RECREATION AND TRANSPORTATION ACTIVITIES			
Timing restrictions for construction activities to avoid breeding season	<ul style="list-style-type: none"><li>• Ecosystem health for coexisting species</li></ul>	Monticello-Dove Creek, Piñon Mesa, San Miguel Basin, Cerro Summit-Cimarron-Sims Mesa, Crawford, Gunnison Basin, Poncha Pass	None
Construction activities in areas with previously active development footprints	<ul style="list-style-type: none"><li>• Improved water quality</li><li>• Property value benefits</li><li>• Enhanced recreational experience</li><li>• Ecosystem health for coexisting species</li></ul>		
Avoid fragmenting habitat with access roads	<ul style="list-style-type: none"><li>• Improved water quality</li><li>• Property value benefits</li><li>• Enhanced recreational experience</li><li>• Ecosystem health for coexisting species</li></ul>		
Monitoring	<ul style="list-style-type: none"><li>• Educational benefits</li></ul>		
Habitat restoration for decommissioned roads	<ul style="list-style-type: none"><li>• Improved water quality</li><li>• Property value benefits</li><li>• Enhanced recreational experience</li><li>• Ecosystem health for coexisting species</li></ul>		
Seasonal restrictions on travel (motorized and unmotorized) in habitat areas	<ul style="list-style-type: none"><li>• Improved water quality</li><li>• Ecosystem health for coexisting species</li></ul>		
<b>Notes:</b> <ul style="list-style-type: none"><li>1. Conservation efforts derived from detailed discussions in activity-specific chapters of this report.</li><li>2. Baseline benefits are those resulting from conservation efforts in occupied habitat or from existing management strategies. Incremental benefits are those resulting from conservation efforts in unoccupied habitat.</li><li>3. All conservation efforts are intended to support the survival and/or recovery of the species.</li><li>4. Benefits are anticipated in the units where these conservation efforts are undertaken, as described in detail in the activity-specific chapters throughout this report.</li></ul>			

## 9.2 ECONOMIC METHODS USED TO ESTIMATE BENEFITS

259. Economists apply a variety of methodological approaches to estimate use and non-use values for species and for habitat improvements. These include stated preference and revealed preference methods. Stated preference techniques include tools such as contingent valuation, conjoint analysis, and contingent ranking. These methods employ survey techniques, asking respondents to state what they would be willing to pay for a resource or for programs designed to protect that resource. A substantial body of literature describes the application of this technique to the valuation of natural resources.
260. More specific to use values for species or habitats, revealed preference techniques examine individuals' behavior in markets in response to changes in environmental or other amenities (i.e., people "reveal" their value through their behavior). For example, travel cost models are frequently applied to value access to recreational opportunities, as well as to value changes in the quality and characteristics of these opportunities. Basic travel cost models assume that the value of a recreation resource can be estimated by analyzing the time and travel costs incurred by individuals visiting the site. Another revealed preference technique is hedonic analysis, which is often employed to determine the effect of specific site characteristics on property values.

### 9.2.1 ESTIMATING BASELINE ECONOMIC BENEFITS

261. Numerous published studies estimate individuals' willingness-to-pay to protect endangered species.<sup>248</sup> The economic values reported in these studies reflect various groupings of benefit categories, including both use and non-use values. For example, these studies assess public willingness-to-pay for wildlife-viewing opportunities; for the option for seeing or experiencing the species in the future; to assure that the species will exist for future generations; and for simply knowing that a species exists. This literature, however, addresses a relatively narrow range of species and circumstances compared to the hundreds of species and habitats that are the focus of the Act.

#### Literature Specific to Sage-Grouse

262. We identified two studies by Loft (1998) and van Kooten and Eiswerth (2007) that estimate the use and non-use benefits, respectively, of the greater sage-grouse.<sup>249,250</sup> The greater sage-grouse is a different species from the Gunnison sage-grouse, but the

<sup>248</sup> See, for example, the summary in Richardson, L. and J. Loomis. March 2009. The Total Economic Value of Threatened, Endangered, and Rare Species: An Updated Meta-Analysis. *Ecological Economics* 68(5): 1535-1548.

<sup>249</sup> Loft, E. R. 1998. Economic contribution of deer, pronghorn antelope, and sage grouse hunting to northeastern California and implications to the overall value of wildlife. Wildlife Management Division. California Department of Fish and Game.

<sup>250</sup> van Kooten, G. C. and M. Eiswerth. The Ghost of Extinction: Preservation values and minimum viable population in wildlife models. Selected paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Portland, Oregon. July 29-August 1, 2007.



two species inhabit similar geographic areas and exhibit similar characteristics. Loft surveyed mule deer, pronghorn antelope, and greater sage-grouse hunters in northeastern California to determine the hunters' contribution to the regional economy. Of the nearly 10,000 hunters surveyed, 42 percent responded. The survey indicated that sage-grouse hunters spent approximately \$91 each, or \$37,000 total during the two-day hunting season. Although Loft's study arrives at a numerical result, the primary activity monetized is hunting. The Gunnison sage-grouse is not currently hunted. Because the study notes that the primary expenditure by greater sage-grouse hunters was for acquisition of the hunting permit, the estimated value may not be applicable to the Gunnison sage-grouse.

263. In van Kooten and Eiswerth's study, the authors extend public preservation benefits beyond willingness-to-pay. The study uses a bioeconomic model and assumes that preservation benefit (and the subsequent policy decision to protect the species) occurs only when a minimum population of the species exists (i.e., to allow for successful biological reproduction). The authors then develop a numerical application of the model to the conservation of the greater sage-grouse across seven states (Colorado, Idaho, Montana, Nevada, Oregon, Utah, and Wyoming).
264. While van Kooten and Eiswerth develop a numerical result of the preservation benefits of conservation of the greater sage-grouse, the application of the model to the species is demonstration of a hypothetical existence value rather than an empirical result. The authors determine the household willingness-to-pay for the greater sage-grouse by examining existing literature estimating willingness-to-pay to preserve various threatened and endangered species.<sup>251</sup> The authors then select what they consider to be a conservative willingness-to-pay per household (\$15) and conduct sensitivity analyses around that value. The authors do not provide empirical data to support this value and do not conduct primary contingent valuation research to determine whether this value is appropriate. Additionally, the authors note that the application of the model estimates benefits for species that are considered charismatic and are hunted. Because the Gunnison sage-grouse is not hunted, this model may not be appropriate. Further, van Kooten and Eiswerth suggest that the marginal willingness-to-pay to preserve an additional species must be identified, but do not identify such a value, stating that such identification is difficult. We are not aware of any other published studies that estimate the value the public places on conserving the sage-grouse and its habitat.<sup>252, 253</sup>

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<sup>251</sup> Specifically, the authors rely on willingness-to-pay data provided in Loomis, J.B. and D.S. White. "Economic Benefits of Rare and Endangered Species: Summary and Meta-analysis." *Ecological Economics* 18(1996): 197-206.

<sup>252</sup> A conversation with Billy Gascoigne at the Fort Collins USGS office revealed that while they are currently undergoing a valuation of ecosystem service benefits for sage-grouse habitat conservation, the study is unpublished and not available to the public. Additionally, he noted the literature available on the economic value of sage-grouse and its habitat is extremely limited. In particular, estimation of economic values for the species is limited because of lack of data on willingness-to-pay to view the species and protect its habitat.

<sup>253</sup> Western State Colorado University and the Colorado Parks and Wildlife maintain extensive centers and knowledge bases for the Gunnison sage-grouse including a rangewide conservation plan. Both of these institutes maintain

#### Potential for Benefit Transfer Analysis

265. Absent primary research, resource management decisions can often be informed by applying the results of existing valuation research to a new policy question – a process known to economists as benefit transfer. Benefit transfer involves the application of unit value estimates, functions, data, and/or models from existing studies to estimate the benefits associated with the resource under consideration.
266. OMB has written guidelines for conducting credible benefit transfers. The important steps in the OMB guidance are: (1) specify the value to be estimated for the rulemaking; and (2) identify appropriate studies to conduct benefits transfer based on the following criteria:
- The selected studies should be based on adequate data, sound and defensible empirical methods and techniques.
  - The selected studies should document parameter estimates of the valuation function.
  - The study and policy contexts should have similar populations (e.g., demographic characteristics). The market size (e.g., target population) between the study site and the policy site should be similar.
  - The good, and the magnitude of change in that good, should be similar in the study and policy contexts.
  - The relevant characteristics of the study and policy contexts should be similar.
  - The distribution of property rights should be similar so that the analysis uses the same welfare measure (i.e., if the property rights in the study context support the use of willingness-to-accept measures while the rights in the rulemaking context support the use of willingness-to-pay measures, benefits transfer is not appropriate).
  - The availability of substitutes across study and policy contexts should be similar.
267. An ideal study for estimating economic benefits of critical habitat designation for the sage-grouse would be specific to the species or would address a closely related species; would consider valuation in a context close to the policy issue in question (i.e., the value the public holds for designating critical habitat for this species; and would address a relevant population holding these values (e.g., citizens of the United States).

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databases of studies related to the Gunnison sage-grouse. A review of these sources did not reveal any economic valuation studies of the sage-grouse or its habitat. See Western State Colorado University Gunnison Sage-grouse <http://www.western.edu/faculty/pmagee/gunnison-sage-grouse> and <http://www.western.edu/directory/programs/sage-grouse> and the Gunnison Sage-grouse Rangewide Conservation Plan at <http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/Birds/Pages/GunnisonConsPlan.aspx>

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268. As described above, two studies estimate the use and non-use values of the greater sage-grouse, a similar species. While Loft's study generates a regional economic contribution value of \$91 per hunter or \$37,000 in total per two-day hunting season, this value is associated with hunting the species within northeastern California. Additionally, although van Kooten and Eiswerth's study arrives at a non-use value of approximately \$81.9 million across a study area that includes the range of the Gunnison sage-grouse, the underlying assumptions regarding willingness-to-pay are unclear and the study assumes a portion of the value is associated with hunting the species.<sup>254</sup> The study demonstrates a hypothetical valuation after applying a model that incorporates biological factors (i.e., minimum viable population), rather than deriving willingness-to-pay to preserve the species. Ultimately, these studies value scenarios that may not be applicable to the change in conservation expected as a result of sage-grouse critical habitat designation.

#### Literature Valuing Other Bird Populations

269. We also reviewed existing literature that addresses use values that may apply to the sage-grouse. For example, a potential benefit of sage-grouse conservation may be increased opportunity for bird watching.<sup>255</sup> The most comprehensive study of the value the public holds for bird-watching was published by the Service as an addendum to its 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation. The net economic value of all bird viewing, estimated using a series of contingent valuation questions to determine net willingness-to-pay, was found to be approximately \$35.7 billion.<sup>256</sup> The value of bird-watching was not disaggregated by species.
270. Other studies estimate the recreational use value of shorebirds in Delaware Bay. One study finds a regional economic contribution of \$67-91 per household per day trip, and \$202-430 per household per overnight trip.<sup>257</sup> Another study estimates willingness-to-pay for the prevention of deaths of non-endangered migratory birds in oil-filled ponds of \$80 per household.<sup>258</sup> Again, these studies address bird populations in general.

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<sup>254</sup> van Kooten, G. C. and M. Eiswerth. The Ghost of Extinction: Preservation values and minimum viable population in wildlife models. Selected paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Portland, Oregon. July 29-August 1, 2007, p. 2.

<sup>255</sup> Sisk-a-dee, the Colorado Parks and Wildlife, and Western State Colorado University maintain a Gunnison sage-grouse conservation viewing wildlife site which attracts birders from many locations to view the Gunnison sage-grouse during lekking season from April 1 through May 15. See <http://www.siskadee.org/view.htm>.

<sup>256</sup> U.S. Fish and Wildlife Service. 2006. Birding in the United States: A Demographic and Economic Analysis. Addendum to the 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation. Report 2006-4.

<sup>257</sup> Myers, K.H. G.R. Parson, and P.E.T. Edwards. 2010. Measuring the Recreational Use Value of Migratory Shorebirds on the Delaware Bay. *Marine Resource Economics*. 25(3):247-264.

<sup>258</sup> Desvousges, W.H., F.R. Johnson, R.W. Dunford, K.J. Boyle, S.P. Hudson, and K.N. Wilson. 1993. Measuring Natural Resource Damage with Contingent Valuation: Tests of Validity and Reliability. In Hausman, J. ed. *Contingent Valuation: A Critical Assessment*. Amsterdam: North Holland Press, 91-164.

271. While the literature supports the notion that the public is willing to pay for the opportunity to view birds, there are no data to indicate how many trips are associated with the sage-grouse; how seeing a sage-grouse would contribute to the value of a bird watching trip; or how the listing of this species and designation of critical habitat could increase the probability of seeing a sage-grouse on a given trip.
272. One study specifically evaluated the economic benefits arising from designating critical habitat for an endangered bird species in the southwestern U.S. The benefits of critical habitat were explored for the Mexican spotted owl in the Four Corners region (i.e., where the borders of Arizona, Colorado, New Mexico, and Utah meet) using a contingent valuation survey.<sup>259</sup> The mean willingness-to-pay for protecting Mexican spotted owl critical habitat was estimated to be \$55 per household.
273. While this study evaluated the value of critical habitat for an endangered bird species, the physical characteristics and habitat type of the Mexican spotted owl are dissimilar from those of the sage-grouse. It is therefore possible that the value the public holds for habitat conservation for the two species may be quite different.<sup>260</sup> In addition, this estimated value of willingness-to-pay depends on the marginal improvement in species conservation expected from critical habitat designation. Information on the conservation improvement expected from sage-grouse critical habitat designation is not available.

#### 9.2.2 ESTIMATING INCREMENTAL ECONOMIC BENEFITS

274. As described above, the published valuation literature does not support the monetization of incremental changes in the conservation probability for the sage-grouse.<sup>261</sup> Quantification and monetization of the incremental benefits of listing a species and designating critical habitat requires information about the change in the probability that the species will be conserved as a result of the listing or designation. No studies exist that provide such information for the sage-grouse. In addition, biological information on the incremental conservation benefit expected from the listing of the species and designation of sage-grouse critical habitat is not available.

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<sup>259</sup> Loomis, J. and E. Ekstrand. 1997. Economic Benefits of Critical Habitat for the Mexican Spotted Owl: A Scope Test Using a Multiple-Bounded Contingent Valuation Survey. *Journal of Agricultural and Resource Economics*. 22(2):356-366.

<sup>260</sup> Metrick, A. and M.L. Weitzman. 1996. Patterns of Behavior in Endangered Species Preservation. *Land Use*. 72(1):1-16.

<sup>261</sup> Richardson and Loomis (2009) developed a model to estimate the value of critical habitat designations based on a meta-analysis of 31 studies published between 1985 and 2005. The model generates composite willingness-to-pay values for species conservation based on an estimate of the percent change in species population likely to result from the critical habitat designation. Implementation of the model requires information regarding the change in the population likely to result from the conservation efforts undertaken in response to the listing or critical habitat designation. Such information is not available for this designation. (Richardson, L. and J. Loomis. March 2009. The Total Economic Value of Threatened, Endangered, and Rare Species: An Updated Meta-Analysis. *Ecological Economics* 68(5): 1535-1548.)

### 9.2.3 ESTIMATING ANCILLARY BENEFITS

275. Ancillary benefits may also be achieved through the species listing and designation of critical habitat. For example, the public may hold a value for habitat conservation, beyond its willingness-to-pay for conservation of a specific species. Studies have estimated the public's willingness-to-pay to preserve wilderness areas; for wildlife management and preservation programs; and for wildlife protection in general. In a contingent valuation study, Loomis et al. estimated the value of sagebrush ecosystem services along a 45-mile riparian stretch of the Platte River (i.e., dilution of waste water, natural purification of water, erosion control, habitat for fish and wildlife, and recreation) at \$82 per acre per year.<sup>262</sup> The study asked participants how much of an increase households would accept on water bills for additional ecosystem services. While this study addresses categories of benefits (e.g., ecosystem services, such as those summarized in Exhibit 9-1) that may be similar to the types of benefits provided by the listing or critical habitat designation, the estimated valuation of the sagebrush habitat is associated with primarily riparian areas that are not representative of sage-grouse habitat. Additionally, the marginal increase in conservation benefits estimated in this study may not be representative of those expected to result from the listing of the sage-grouse or critical habitat designation.

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<sup>262</sup> Loomis, J., P. Kent, L. Strange, K. Faush, and A. Covich, 2000. Measure the total economic value of restoring ecosystem services in an impaired river basin: results from a contingent valuation survey. *Ecological Economics*. 33:103-117.

## REFERENCES

2 U.S.C. §§ 1531 et seq.

2 U.S.C. §§ 1501 et seq.

5 U.S.C. §§ 601 et seq.

16 U.S.C. § 1532.

16 U.S.C. § 1533(b)(2).

64 FR 43255.

2010 12-Month Determination, 75 FR 59804-59863.

2013 Endangered Status Proposed Rule, 78 FR 2486-2538.

2013 Proposed Rule, 78 FR 2540-2570.

Alexander, Ronald. Residential engineer, Colorado Department of Transportation.  
Personal communication on April 9, 2013.

American Wind Energy Association. Siting Policy. Federal Aviation Administration.  
Accessed at <http://www.awea.org/issues/siting/> on May 24, 2013.

*American Trucking Association vs. EPA*, 175 F. 3d 1027, 2044 (D.C. Cir. 1999).

*Arizona Cattle Growers v. Salazar*, 606 F. 3d 1160 (9th Cir. 2010), cert. denied, 179  
L. Ed. 2d 300, 2011 U.S. LEXIS 1362, 79 U.S.L.W. 3475 (2011).

Atchley, C.D., C.B. Hovde, J.M. Roeber. Public comment on behalf of Delta County  
Board of County Commissioners submitted on March 30, 2013.

Backhaus, G. State Resource Conservationist, NRCS Colorado State Office. Personal  
communication on April 30, 2013.

Bartlett, E. Tom, et al. 2002. "Valuing grazing use on public land." *Journal of Range  
Management*. Volume 55 (426-438).

Bingham, K. FSA Colorado State Office. Personal communication on May 2, 2013.

Boeke, E. NRCS Utah State Office. Personal communication on May 1, 2013.

Bureau of Economic and Business Research, David Eccles School of Business,  
University of Utah. *The Structure and Economic Impact of Utah's Oil and Gas  
Exploration and Production Industry*. July 2009.

Bureau of Land Management. Case Recordation. Geothermal Leases Issued.  
Accessed at  
[http://www.blm.gov/co/st/en/BLM\\_Programs/oilandgas/oil\\_and\\_gas\\_lease/2012/  
/february\\_9\\_2012\\_lease.html](http://www.blm.gov/co/st/en/BLM_Programs/oilandgas/oil_and_gas_lease/2012/february_9_2012_lease.html) on May 24, 2013.

- Bureau of Land Management. Colorado Renewable Energy. Accessed at [http://www.blm.gov/co/st/en/BLM\\_Programs/energy/renewable\\_energy.html](http://www.blm.gov/co/st/en/BLM_Programs/energy/renewable_energy.html) on May 24, 2013.
- Bureau of Land Management. Environmental Assessment of Geothermal Lease Nomination, Gunnison County, Colorado. March 2011.
- Bureau of Land Management. Monticello Field Office. Record of Decision and Approved Resource Management Plan. November 2008.
- Bureau of Land Management. San Luis Valley Field Office Geothermal Leasing RMP Amendment. Final. October 2012.
- Bureau of Land Management. Utah Wind Energy. Accessed at [http://www.blm.gov/ut/st/en/prog/energy/wind\\_energy.html](http://www.blm.gov/ut/st/en/prog/energy/wind_energy.html) on May 1, 2013.
- Cameco. Uranium Spot Price History. Accessed at [http://www.cameco.com/investors/markets/uranium\\_price/spot\\_price\\_complete\\_history/](http://www.cameco.com/investors/markets/uranium_price/spot_price_complete_history/) on May 15, 2013.
- Center for Biological Diversity et al., Plaintiffs, v. United States Bureau of Land Management et al., Defendants and American Sand Association, et al., Defendant Intervenors. Order re: Cross Motions for Summary Judgment, Case 3:03-cv-02509 Document 174 Filed 03/14/2006. (44-45)
- Childers, Theresa. Wildlife biologist. National Park Service. Personal communication on April 22, 2013.
- Clarke, Kathleen. Director, Utah Office of the Governor Public Lands Policy Coordination. Public comment submitted on April 2, 2013.
- Clow, John H., General Counsel. Public comment submitted on behalf of Upper Gunnison River Water Conservancy District on April 2, 2013.
- Cochrane, J. Gunnison County. Personal communication on March 21, 2013.
- Colorado Bureau of Land Management. February 9, 2012 Oil and Gas Lease Sale. GIS data of geothermal parcels downloaded from [http://www.blm.gov/co/st/en/BLM\\_Programs/oilandgas/oil\\_and\\_gas\\_lease/2012/february\\_9\\_2012\\_lease.html](http://www.blm.gov/co/st/en/BLM_Programs/oilandgas/oil_and_gas_lease/2012/february_9_2012_lease.html) on May 1, 2013.
- Colorado Bureau of Land Management. Oil & Gas Leasing Instructions. Accessed at [http://www.blm.gov/co/st/en/BLM\\_Programs/oilandgas/CO\\_leasing\\_information.html](http://www.blm.gov/co/st/en/BLM_Programs/oilandgas/CO_leasing_information.html) on May 15, 2013.
- Colorado Bureau of Land Management. San Luis Valley Field Office Geothermal Leasing. Accessed at [http://www.blm.gov/co/st/en/fo/slvfo/Geothermal\\_Leasing.html](http://www.blm.gov/co/st/en/fo/slvfo/Geothermal_Leasing.html) on May 24, 2013.
- Colorado Department of Local Affairs, State Demography Office. Preliminary Population Forecasts for Colorado Counties, 2000-2040 (1-year increments).



Downloaded from:

<http://www.colorado.gov/cs/Satellite?c=Page&childpagename=DOLA-Main%2FCBONLayout&cid=1251593346867&pagename=CBONWrapper> on May 24, 2013.

Colorado Division of Reclamation, Mining & Safety. Uranium Mining in Colorado 2013. Accessed at [mining.state.co.us/SiteCollectionDocuments/UraniumMining.pdf](http://mining.state.co.us/SiteCollectionDocuments/UraniumMining.pdf) on May 2, 2013.

Colorado Energy Research Institute. Colorado School of Mines. Oil and Gas Economic Impact Analysis. June 2007.

Colorado Oil and Gas Conservation Commission. 1200 Series Protection of Wildlife Resources. Accessed at <http://cogcc.state.co.us/> on May 15, 2013.

Colorado Oil and Gas Conservation Commission. Amended Rules, Appendix VII – Restricted Surface Occupancy Maps (Amended) and Appendix VIII – Sensitive Wildlife Habitat Maps. Accessed at <http://cogcc.state.co.us/> on May 15, 2013.

Colorado Oil and Gas Conservation Commission. Frequently Asked Questions: MOU Concerning Application of COGCC Rules On Federal Lands in Colorado.

Colorado Oil and Gas Conservation Commission. GIS Downloads. GIS data for well surface locations and oil and gas permit locations accessed at: <http://cogcc.state.co.us/> on March 5, 2013.

Department of Interior, Secretarial Order # 3206: Subject: American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act, June 1997.

Desvousges, W.H., F.R. Johnson, R.W. Dunford, K.J. Boyle, S.P. Hudson, and K.N. Wilson. 1993. Measuring Natural Resource Damage with Contingent Valuation: Tests of Validity and Reliability. In Hausman, J. ed. *Contingent Valuation: A Critical Assessment*. Amsterdam: North Holland Press, 91-164.

Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifier," on May 27, 2013.

Dozier, C., S. Whinnery, S. Thompson. Comment submitted on behalf of Hinsdale County on May 1, 2013

Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights, March 15, 1988.

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

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments.

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

- Executive Order 13563, *Improving Regulation and Regulatory Review*, January 18, 2011.
- Fedel, F.M., L.M. Padgett, D. Batchelder. Public comment on behalf of Ouray County Board of County Commissioners submitted on March 26, 2013.
- Federal Government Schedule Rates, Office of Personnel Management, 2013.
- Fernandez, Dan. Vice Chair, Dolores County Development Corporation. Personal communication on April 26, 2013.
- Fischer, E., A. Goodtimes, J. May. Public comment on behalf of San Miguel County Board of Commissioners submitted on April 2, 2013.
- Fife, K., L. Dannenberger. Mesa County. Personal communication on March 11, 2013.
- Fife, K. Mesa County. Personal communication on March 11, 2013.
- Fife, K. Mesa County. Personal communication on March 12, 2013.
- Gascoigne, Billy. Economist. U.S. Geological Survey. Personal communication on May 23, 2013.
- Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, 378 F.3d 1059 (9<sup>th</sup> Cir. 2004); *Sierra Club v. U. S. Fish and Wildlife Service*, 245 F.3d 434 (5<sup>th</sup> Cir. 2001).
- Golbricht, D., Doug Stowe, Julie Kibel, and Ernie Williams. Dolores County representatives. Personal communication on April 2, 2013.
- Gramlich, Edward M., *A Guide to Benefit-Cost Analysis* (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990.
- Gunnison Basin Sage-Grouse Strategic Committee. 2013. Draft Candidate Conservation Agreement For the Gunnison Sage-grouse, *Centrocercus minimus*, Gunnison Basin Population.
- Gunnison County Board of County Commissioners. Public comment submitted on April 2, 2013. (92)
- Gunnison Sage-Grouse Rangewide Conservation Plan. Gunnison Sage-Grouse Rangewide Steering Committee, Colorado Division of Wildlife. April 2005.
- Harriman, E., E. Seymour, S. Cave, B. Nesbitt, R. Drexel. Public comment on behalf of the City of Gunnison submitted on March 26, 2013.
- Henderson, R., D. White, G. Ellis. Public comment on behalf of Montrose County Board of County Commissioners submitted on April 1, 2013.
- Henkel, M. and M. Coghill. 2009. Mitigation Recommendation: Gunnison Valley Partners-Gunnison Rising Project Wildlife/Gunnison Sage-Grouse.

Home Builders Association of Northern California v. United States Fish and Wildlife Service, 616 F.3d 983 (9th Cir. 2010), cert. denied, 179 L. Ed 2d 301, 2011 U.S. Lexis 1392, 79 U.S.L.W. 3475 (2011).

Imamura, E.R., U.S. Army Corps of Engineers, Sacramento District. Email communication on May 30, 2013.

Jones, L. FSA Utah State Office. Personal communication on May 3, 2013.

Justman, J. Public comment on behalf of Mesa County Board of County Commissioners submitted on April 2, 2013.

Lawler, Mark. Threatened and endangered species biologist. Colorado Department of Transportation. Personal communication on April 26, 2013.

Lewandrowski, Jan and K. Ingram. "Restricting Grazing on Federal Lands in the West to Protect Threatened and Endangered Species: Ranch and Livestock Sector Impacts." Review of Agricultural Economics, Volume 24, Number 1 (78-107).

Liston, Kelley. Range Conservationist, Grand Mesa Uncompahgre and Gunnison National Forests, Ouray Ranger District. Personal communication on April 11, 2013.

Livestock Associations. Public comment submitted on April 2, 2013.

Loft, E. R. 1998. Economic contribution of deer, pronghorn antelope, and sage grouse hunting to northeastern California and implications to the overall value of wildlife. Wildlife Management Division. California Department of Fish and Game.

Loomis, J. and E. Ekstrand. 1997. Economic Benefits of Critical Habitat for the Mexican Spotted Owl: A Scope Test Using a Multiple-Bounded Contingent Valuation Survey. Journal of Agricultural and Resource Economics. 22(2):356-366.

Loomis, J., P. Kent, L. Strange, K. Faush, and A. Covich, 2000. Measure the total economic value of restoring ecosystem services in an impaired river basin: results from a contingent valuation survey. Ecological Economics. 33:103-117.

Lopez, Chris S. Public comment submitted on behalf of D.J. Simmons, Inc. on April 2, 2013.

Lopez, Chris. Regulatory Specialist, D.J. Simmons, Inc. Personal communication on April 25, 2013.

Maez, W. Saguache County. Personal communication on April 4, 2013.

Magee, P. Western State Colorado University. Gunnison Sage-grouse. Accessed at <http://www.western.edu/faculty/pmagee/gunnison-sage-grouse> on May 23, 2013.

- Maryboy, Kenneth. Public comment submitted on behalf of the San Juan County Commission on April 1, 2013.
- May, J. Public comment submitted on behalf of San Miguel County on April 2, 2013.
- McCarl, Bruce. Technical review comments on June 11, 2013.
- Metrick, A. and M.L. Weitzman. 1996. Patterns of Behavior in Endangered Species Preservation. *Land Use*. 72(1):1-16.
- Mid-Tex Electric Cooperative, INC. V. Federal Energy Regulatory Commission, 773 F. 2d 327 (D.C. Cir. 1985).
- Montgomery, Susan B., Montgomery & Interpreter, plc. Public comment submitted on behalf of the Yavapai-Apache Nation on December 27, 2010.
- Montgomery, Susan B., Special Legal Counsel to the Yavapai-Apache Nation. Public comment submitted in response to the Proposed Rule for designation of Southwestern willow flycatcher critical habitat on October 14, 2011.
- Montrose County Board of County Commissioners. Public Comment on the Proposed Designation of Critical Habitat for the Gunnison Sage-grouse. April 1, 2013.
- Myers, K.H. G.R. Parson, and P.E.T. Edwards. 2010. Measuring the Recreational Use Value of Migratory Shorebirds on the Delaware Bay. *Marine Resource Economics*. 25(3):247-264.
- New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service, 248 F.3d 1277 (10th Cir. 2001).
- Ponish, Matthew T. Public comment submitted on behalf of the FSA Conservation and Environmental Programs Division on March 11, 2013.
- Pub Law No. 104-121.
- Ranger, Richard. Public comment submitted on behalf of the American Petroleum Institute on April 2, 2013. [Docket number FWS-R6-ES-2012-0108]
- Ranger, Richard. Public comment submitted on behalf of the American Petroleum Institute on April 2, 2013. [Docket number FWS-R6-ES-2011-0111]
- Red Metal Limited. *Annual Report*. 2012.
- Reimer, D. Chaffee County. Personal communication on April 1, 2013.
- Richardson, L. and J. Loomis. March 2009. The Total Economic Value of Threatened, Endangered, and Rare Species: An Updated Meta-Analysis. *Ecological Economics* 68(5): 1535-1548.
- Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2012-2013*, 2012.

- Rowan, R. C., and J.P. Workman. 1992. "Factors affecting Utah ranch prices." *Journal of Range Management*. Volume 45 (263-266).
- Sackett, Heather. "State grants license to Energy Fuels." *Telluride Daily Planet*. April 28, 2013. Accessed at <http://telluridenews.com/articles/2013/05/06/news/doc517b0422dd62f760154256.txt> on May 15, 2013.
- Sandberg, N. San Juan County Planner. Personal communication on March 6, 2013
- Sandberg, N. San Juan County Planner. Personal communication on May 2, 2013.
- San Miguel County Board of County Commissioners. Public Comment on the Proposed Designation of Critical Habitat for the Gunnison Sage-grouse. April 2, 2013.
- Schauer, Ken. State Geospatial Manager, BLM Colorado State Office. GIS data provided via personal communication on April 5, 2013.
- Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 3, 2013.
- Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 8, 2013.
- Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 15, 2013.
- Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 29, 2013.
- Sell, Robin. Wildlife biologist, BLM Colorado State Office. Personal communication on April 30, 2013.
- Sisk-a-dee, Colorado Parks and Wildlife, Western State Colorado University. Gunnison sage-grouse conservation viewing wildlife site. Accessed at <http://www.siskadee.org/view.htm>. on May 23, 2013.
- Small Business Size Regulations, Title 13: Business Credit and Assistance, Chapter I: Small Business Administration, Part 121: Small Business Size Regulations.
- Spahr, R. and M.A. Sunderman. 1995. "Additional evidence on the homogeneity of the value of government grazing leases and changing attributes for ranch value." *Journal of Real Estate Research*, Volume 10 (601-616).
- Stahlnecker, K. Letter to City of Gunnison and Gunnison Valley Partners Re: Gunnison Rising Annexiation. April 9, 2009
- Starkebaum, N. Gunnison County. Personal communication on March 4, 2013.
- Steas, Clay. Biologist, US Department of Agriculture Forest Service. Personal communication on April 22, 2013.

- Stern, Bill S. "Permit Value: A Hidden Key to the Public Lands Grazing Dispute," University of Montana, Master of Science thesis, 1998.
- Stowe, Douglas R., Julie R. Kibel, Ernest R. Williams. Public comment submitted on behalf of the Dolores County Board of County Commissioners on March 27, 2013.
- Sunderman, M. A. and R. Spahr. 1992. "Valuation of government grazing leases." *Journal of Real Estate Research*, Volume 9 (179-196).
- Swenson, Paula, Phil Chamberland, Jonathan Houck. Public comment submitted on behalf of the Board of County Commissioners of the County of Gunnison, Colorado, on April 2, 2013.
- Thorson, Jon P. Public comment submitted on behalf of RM Potash on March 5, 2013.
- Tiller, Veronica E. Velarde. "Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations." Bow Arrow Publishing Company, 2005. (512-516)
- Torell et al. 2001. "The Lack of Profit motive for ranching: Implications for policy analysis." *Current issues in Rangeland Economics*, Western Coordinating Committee 55 (WCC-55);
- Torell et al. 2012. "The Market Value of Ranches and Grazing Permits in New Mexico, 1996 to 2010." New Mexico State University. Research Report 779.
- Torell et al., "Ranch level impacts of changing grazing policies on BLM land to protect the Greater Sage-Grouse: Evidence from Idaho, Nevada, and Oregon." Policy Analysis Center for Western Public Lands, Policy Paper SGB01B02, 2002.
- Torell, L. Allen and M.E. Kincaid. 1996. "Public land policy and the market value of New Mexico ranches, 1979-1994." *Journal of Range Management*, Volume 49 (270-276).
- Torell, L. Allen and S.A. Bailey. 1991. "Public land policy and the value of grazing permits." *Western Journal of Agricultural Economics*, Volume 16 (174-184).
- U.S. Census Bureau, 2007-2011 American Community Survey 5-Year Estimates.
- U.S. Department of Agriculture. National Agricultural Statistics Service. Land Values 2012 Summary. August 2012.
- U.S. Department of Agriculture. National Agricultural Statistics Service. Quick Stats. Value of cattle, including calves – inventory, measured in \$/head, 2012.
- U.S. Department of Energy. Draft Uranium Leasing Program Programmatic Environmental Impact Statement. March 2013. Accessed at <http://ulpeis.anl.gov/> on May 15, 2013.

- U.S. Energy Information Administration. Annual Energy Outlook 2013 with Projections to 2040. April 2013.
- U.S. Environmental Protection Agency. Clean Water Act, Section 404. Website <http://water.epa.gov/lawsregs/guidance/wetlands/sec404.cfm>. Accessed on May 10, 2013.
- U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, EPA 240-R-00-003, September 2000, accessed at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.
- U.S. Environmental Protection Agency. "Regulatory Flexibility Act/Small Business Regulatory Enforcement Fairness Act (RFA/SBREFA). What is a "small government?" Accessed at <http://www.epa.gov/sbrefa/government.htm> on August 10, 2005.
- U.S. Fish and Wildlife Service. 2002. "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at <http://endangered.fws.gov/hcp/>.
- U.S. Fish and Wildlife Service. 2006. Birding in the United States: A Demographic and Economic Analysis. Addendum to the 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation. Report 2006-4.
- U.S. Fish and Wildlife Service. 2010. Conference Report for the Natural Resources Conservation Service Sage-grouse Initiative (SGI). July 30, 2010.
- U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse. February 25, 2013.
- U.S. Fish and Wildlife Service. Personal communication on June 21, 2013.
- U.S. Fish and Wildlife Service. Personal communication on May 17, 2013.
- U.S. Fish and Wildlife Service. Personal communication on March 21, 2013.
- U.S. Fish and Wildlife Service and BLM Colorado State Office. Personal communication on May 20, 2013.
- U.S. Fish and Wildlife Service Western Colorado Field Office. Biologist. Personal communication on March 22, 2013.
- U.S. Fish and Wildlife Service Western Colorado Field Office. Biologist. Personal communication on May 13, 2013.
- U.S. Geological Survey, Gap Analysis Program (GAP). November 2012. Protected Areas Database of the United States (PADUS), version 1.3 Combined Feature Class.
- U.S. Geological Survey. National Land Cover Database 2006 (NLCD2006). Downloaded from: [www.mrlc.gov/finddata.php](http://www.mrlc.gov/finddata.php) on April 24, 2013.



- U.S. Office of Management and Budget. 2011. "Regulatory Impact Analysis: Frequently Asked Questions (FAQs)," February 7, 2011. Accessed at [http://www.whitehouse.gov/sites/default/files/omb/circulars/a004/a-4\\_FAQ.pdf](http://www.whitehouse.gov/sites/default/files/omb/circulars/a004/a-4_FAQ.pdf) on May 3, 2011.
- U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, accessed at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.
- 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.
- U.S. Office of Management and Budget, Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27. July 13, 2001. Accessed at: <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.
- Utah Bureau of Land Management. GIS data for oil and gas leases accessed at: [http://www.blm.gov/ut/st/en/prog/more/geographic\\_information/gis\\_data\\_and\\_maps.html](http://www.blm.gov/ut/st/en/prog/more/geographic_information/gis_data_and_maps.html) on April 24, 2013.
- Utah Division of Oil, Gas and Mining. Department of Natural Resources. GIS data for oil and gas wells accessed at: <http://gis.utah.gov/data/energy/oil-gas/> on April 24, 2013.
- Utah Governor's Office of Planning & Budget. 2012 Baseline County Population Projections. Downloaded from: <http://www.governor.utah.gov/dea/projections.html> on May 24, 2013.
- van Kooten, G. C. and M. Eiswerth. The Ghost of Extinction: Preservation values and minimum viable population in wildlife models. Selected paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Portland, Oregon. July 29-August 1, 2007.
- Washburn, Doug. Public comment submitted on behalf of Gunnison County Stockgrowers' Association, Inc. on March 29, 2013.
- Wenum, J. Letter to City of Gunnison and Gunnison Basin Sage Grouse Strategic Committee Re: Gunnison Rising Annexation. February 4, 2009.
- Westbay, S. City of Gunnison. Personal communication on March 21, 2013.
- Westbay, S. City of Gunnison. Personal communication on April 25, 2013.
- Westbay, S., K. Coleman., J. Cochrane, and W. Hansen. City of Gunnison and Gunnison County. Personal Communication on March 21, 2013.
- Western Energy Alliance, Public Lands Advocacy, the Independent Petroleum Associated on America, and the Colorado Oil & Gas Association. Public comment submitted on April 2, 2013. [Docket number FWS-R6-ES-2012-0108]

Western State Colorado University. Gunnison Sage-grouse. Accessed at <http://www.western.edu/directory/programs/sage-grouse> on May 23, 2013.

Weston, Brandon. Environmental services director. Utah Department of Transportation. Personal communication on April 24, 2013.

White House, Memorandum for the Heads of Executive Departments and Agencies: Subject: Tribal Consultation, November 5, 2009. Accessed at: <http://www.whitehouse.gov/the-press-office/memorandum-Tribal-consultation-signed-president>.

White, S and. J Waschbusch. Montrose County. Personal communication on April 8, 2013.

Whitmore, M. Attorney. Ouray County. Personal communication on March 18, 2013.

Zeller, Christi. Public comment submitted on behalf of La Plata County Energy Council on April 1, 2013.

## APPENDIX A | ADDITIONAL STATUTORY REQUIREMENTS

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

### A.1 SBREFA ANALYSIS

3. When a Federal agency proposes regulation, 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 governmental jurisdictions as defined by the RFA).<sup>263</sup> No initial regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities.

#### A.1.1 BACKGROUND

4. Three types of small entities are defined in the RFA:
  - **Small Business** – Section 601(2) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently-owned and operated and is not dominant in its field of operation. The Small Business Administration (SBA) has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR

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<sup>263</sup> 5 U.S.C. §§ 601 et seq.

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 government 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, education institutions, irrigation districts, public utilities, agricultural co-ops, etc.

5. 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 that expected to be regulated were large businesses; however, their customers – transmitting utilities such as electric cooperatives – include numerous small entities. In this case, the court agreed that FERC simply authorized large electric generators to pass these costs through to their transmitting and retail utility customers, and FERC could therefore certify that small entities were not directly impacted within the definition of the RFA.<sup>264</sup>
6. 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.<sup>265</sup> 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 the authority under this rule to impose regulations directly on small entities and therefore small entities were not directly impacted within the definition of the RFA.

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<sup>264</sup> *Mid-Tex Electric Cooperative, INC. V. Federal Energy Regulatory Commission*, 773 F. 2d 327 (D.C. Cir. 1985).

<sup>265</sup> *American Trucking Association vs. EPA*, 175 F. 3d 1027, 2044 (D.C. Cir. 1999).

7. Following the court decisions described above, this analysis considers only those entities directly regulated by the Proposed Rule. The regulatory mechanism through which critical habitat protections are realized is section 7 of the Act, which requires Federal agencies, in consultation with the Service, to insure that any action authorized, funded, or carried out by the Agency is not likely to adversely modify critical habitat. Therefore, under a strict interpretation of the definition of a “directly regulated entity,” only Federal action agencies are subject to a regulatory requirement (i.e., to avoid adverse modification) as a result of the designation. Because Federal agencies are not small entities, under this interpretation, the Service may certify that the proposed critical habitat rule will not have a significant economic impact on a substantial number of small entities.
8. We acknowledge, however, that in some cases, third-party proponents of the action subject to permitting or funding may participate in a section 7 consultation and thus may be indirectly affected. While these entities are not directly regulated, the Service has requested information regarding the potential number of third parties participating in consultations on an annual basis in order to ensure a robust examination of the effects of the Proposed Rule. Below, we provide that information. We also provide information to assist the Service in determining whether these entities are likely to be “small,” and whether the number of potentially affected small entities is “substantial.”<sup>266</sup>

#### A.1.2 THIRD-PARTY PARTICIPANTS IN SECTION 7 CONSULTATIONS

9. As described in Chapters 3 through 8, we anticipate section 7 consultations will address the following activities:
  - **Livestock grazing:** We anticipate that seven BLM field offices and the GMUG National Forests will each participate in one programmatic consultation in 2013. No third parties are expected to participate in these consultations. Our analysis also considers impacts associated with AUM reductions on Federal grazing allotments resulting from these consultations. Although third-party ranchers are not directly regulated under the Proposed Rule, ranchers may incur economic impacts associated with these reductions. AUM reductions on allotments within unoccupied critical habitat are considered incremental impacts of the Proposed Rule. We also forecast impacts to grazing on Ute Mountain Ute Tribal fee lands. Tribes are not subject to review under the RFA/SBREFA. For example, in its guidance on preparing analyses in compliance with the RFA/SBREFA, the EPA states that, “for the purposes of the RFA, States and Tribal governments are not

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<sup>266</sup> The RFA does not provide quantitative thresholds to defining the terms “substantial” and “significant.” In its guidance to Federal agencies on complying with the RFA, SBA provides qualitative descriptions of these terms, leaving the Agencies with discretion to interpret these terms on a case-by-case basis.

considered small governments but rather as independent sovereigns."<sup>267</sup>

Tribal businesses may, however, be considered small businesses under the relevant industry size standards.<sup>268</sup> Information on whether the ranch located on proposed fee lands should be considered a Tribal business is not readily available.

- **Agriculture and water management:** We anticipate that FSA and NRCS will each participate in one programmatic consultation with the Service in 2013 to consider the effects of the agencies' agricultural programs on the sage-grouse and its habitat. No third parties are expected to participate in these consultations, and conservation efforts implemented on participating farms are not expected to change as a result of consultation. Therefore, impacts to small entities are not anticipated. We also forecast a single formal consultation with the Corps, and the Upper Gunnison River WCD as a third party, for the Cunningham Lake Reservoir restoration in occupied sage-grouse habitat.
- **Mineral and fossil fuel extraction:** We forecast approximately nine formal consultations for oil and gas extraction on BLM lands annually. Oil and gas companies are likely to participate in these consultations as third parties. Additionally, we anticipate a single formal consultation in 2013 related to exploratory potash drilling on BLM lands. This drilling will be conducted by RM Potash. RM Potash may participate in consultation as a third party.
- **Residential and related development:** We forecast approximately 15 section 7 consultations for development projects over 20 years, of which no more than three occur in a single year. These consultations will involve the Corps as the Federal action agency, and are likely to involve private developers as third parties.
- **Renewable energy development:** We forecast one consultation in 2013 to consider a wind energy development constructed by Eco-Power Wind Farms in occupied sage-grouse habitat. The relevant action agency may be either the Corps or the Federal Aviation Administration. We assume that Eco-Power Wind Farms may participate as a third party.

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<sup>267</sup> U.S. Environmental Protection Agency. "Regulatory Flexibility Act/Small Business Regulatory Enforcement Fairness Act (RFA/SBREFA). What is a "small government?" Accessed at <http://www.epa.gov/sbreffa/government.htm> on August 10, 2005.

<sup>268</sup> Tribal businesses, like other businesses, can be considered small entities under RFA/SBREFA if they meet the requisite size standards. The Small Business Size Regulations state that "Business concerns owned and controlled by Indian Tribes, Alaska Native Corporations (ANCs) organized pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601 *et seq.*), Native Hawaiian Organizations (NHOs), Community Development Corporations (CDCs) authorized by 42 U.S.C. 9805, or wholly-owned entities of Indian Tribes, ANCs, NHOs, or CDCs are not considered affiliates of such entities." Small Business Size Regulations, Title 13: Business Credit and Assistance, Chapter I: Small Business Administration, Part 121: Small Business Size Regulations.

- **Recreation:** We anticipate that BLM and USFS will undertake programmatic consultations to consider recreation activities on their lands. These consultations will not involve third-party participants. Therefore, small entities are not expected to be affected.
  - **Transportation projects:** We anticipate that BLM and USFS will undertake programmatic consultations to consider transportation activities on their lands. These consultations will not involve third-party participants. Therefore, small entities are not expected to be affected.
10. We consider each activity for which third parties may incur costs associated with section 7 consultation. Our analysis of these activities is described in more detail below and summarized in Exhibits A-1 and A-2.

#### Livestock Grazing

11. Across the 12 counties included in the proposed designation, there are 118 businesses in the beef cattle ranching and farming industry. Of these, 112 (95 percent) have annual revenues at or below the small business threshold of \$750,000, and thus are considered small (see Exhibit A-1). These entities are not expected to participate in programmatic section 7 consultations with BLM and USFS. As a result, we do not forecast administrative impacts to small entities. However, these entities may be affected by AUM reductions recommended through consultation.
12. Our analysis estimates the impacts of AUM reductions in perpetuity, assuming that the loss of value associated with AUMs will be incurred by ranchers following the designation of critical habitat in 2013. Of the 310 allotments overlapping the proposed designation, 63 allotments that overlap unoccupied habitat may require incremental AUM reductions. Although a rancher may hold permits for more than one allotment, information on the actual number of ranchers holding permits within the proposed designation is not readily available. We therefore assume that a separate small entity manages each allotment. Thus, at most 63 small entities may be affected by incremental AUM reductions. This represents approximately 56 percent of small ranchers across the study area.
13. Total incremental impacts to small entities are \$1.1 million, or on average, \$7,500 per allotment. We assume that each grazing entity has annual revenues of \$410,000, which is calculated as the weighted average revenue for small entities in beef cattle ranching and farming.<sup>269</sup> Average forecast impacts therefore represent approximately 1.8 percent of the average annual revenue per small entity (see Exhibit A-2).<sup>270</sup>

<sup>269</sup> The NAICS code for the beef cattle ranching and farming industry is 112111. Annual revenue data for this NAICS code were obtained from Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2012-2013*, 2012. Weighted average annual revenues are calculated using the average annual revenue reported for each small entity size class. These averages are then weighted based on the number of entities reported for each size class.

<sup>270</sup> The assumption that ranchers do not hold permits for more than one allotment results in an estimate of the maximum number of small entities that may be affected. Because the geographic area that may experience



#### Agriculture and Water Management

14. Administrative impacts associated with programmatic consultations on agricultural activities are expected to be incurred by NRCS and FSA. Federal agencies are not considered small. However, we forecast one formal consultation for water management that may result in administrative impacts to the Upper Gunnison River WCD. The water management project associated with this consultation is located in occupied habitat. As a result, we only forecast incremental administrative effort associated with the consideration of adverse modification of critical habitat.
15. Information on the annual revenue of the Upper Gunnison River WCD is not available. Our analysis conservatively assumes that revenues are less than \$7.0 million, the size standard for entities engaged in water supply and irrigation systems.<sup>271</sup> Under that assumption, the Upper Gunnison River WCD represents one percent of small entities in the study area. The Upper Gunnison River WCD will incur \$880 in third-party administrative impacts in 2013. In order for impacts to reach one percent of annual revenues, the Upper Gunnison River WCD would need to have annual revenues of less than \$88,000.

#### Mineral and Fossil Fuel Extraction

16. Across the counties included in the proposed designation, 23 businesses are engaged in oil and gas extraction. Of these, 11 (48 percent) employ fewer than 500 people. These 11 are therefore considered small.
17. To determine how many entities may be affected by the designation, we assume that a separate company is affected by each forecast consultation in a given year. Our analysis forecasts approximately 5.8 consultations per year in unoccupied proposed critical habitat, and 2.5 consultations per year in occupied habitat. If we conservatively assume that nine small entities are affected in a given year, this represents approximately 82 percent of small entities in the study area. However, because less than half of entities within the study area are small, we also consider impacts if the same proportion (48 percent) of affected entities are small. This results in approximately five small entities affected each year, or 39 percent of small entities within the study area.
18. Annualized administrative impacts to third parties associated with oil and gas extraction are \$17,000. Each consultation in unoccupied habitat results in third-party incremental impacts of approximately \$2,600 per entity. Assuming weighted average

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incremental AUM reductions is small compared to total grazing area within the proposed designation, this assumption likely overstates the percentage of small entities affected. Conversely, this assumption likely understates the potential impact per entity if ranchers incur costs associated with more than one allotment. For example, if we assume that, on average, a rancher holds permits for five allotments, approximately 13 ranchers (11 percent) could be affected. Under this same assumption, a rancher would incur costs associated with AUM reductions on five allotments, or approximately \$38,000. This represents approximately 9.2 percent of weighted average annual revenues per entity. Information on the actual number of ranchers holding grazing permits within the proposed designation is not readily available.

<sup>271</sup> The NAICS code for water supply and irrigation systems is 221310.

annual revenues of \$7.3 million for small entities in the oil and gas extraction industry, this impact represents 0.04 percent of revenue.<sup>272</sup> Each consultation in occupied habitat results in third-party incremental impacts of approximately \$880 per entity. This impact represents 0.01 percent of average annual revenues per entity.

19. In addition to oil and gas extraction, we forecast one formal consultation for exploratory potash extraction in unoccupied habitat. We expect that RM Potash, a division of Red Metal, Ltd., will participate in this consultation as a third party. To be considered a small entity in the potash, soda, and borate mineral mining industry, a company must have fewer than 500 employees.<sup>273</sup> Employment information for Red Metal, Ltd. is not available. As a result, we conservatively assume that the company is small. Our analysis forecasts administrative impacts of \$2,600 in 2013. This represents 0.5 percent of 2012 revenue for Red Metal, Ltd.<sup>274</sup>

#### Residential and Related Development

20. Across the counties included in the proposed designation, 1,742 businesses are engaged in residential and related development.<sup>275</sup> Of these, nearly 100 percent (1,740) have annual revenues at or below the small business size standard for their respective NAICS codes.
21. Our analysis forecasts approximately 15 consultations associated with development activities during the 20-year analytic time frame, with no more than three consultations in a single year. Approximately eight of these 15 consultations are forecast for unoccupied habitat. For consultations in unoccupied habitat, third parties will incur both administrative costs of consultation and project modification costs associated with purchasing land set-asides. Assuming that one consultation occurs in unoccupied habitat in a single year, the third-party developer may incur administrative costs of approximately \$2,600. This developer will also incur costs associated with the purchase of land set-asides, assumed to be \$8,800, or the average of annual land set-aside impacts in unoccupied habitat. Assuming weighted average annual revenues of \$4.4 million per small developer, the combined administrative and project modification costs (approximately \$11,000) represent less than 0.3 percent of revenue.<sup>276</sup>

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<sup>272</sup> Weighted average annual revenues are calculated using the average annual revenue reported for each small entity size class for the oil and gas extraction NAICS code, 211. These averages are then weighted based on the number of entities reported for each size class. Data for this estimation is from Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2012-2013*, 2012.

<sup>273</sup> The NAICS code for the potash, soda, and borate mineral mining industry is 212391.

<sup>274</sup> Red Metal Limited. *Annual Report*. 2012.

<sup>275</sup> To estimate the number of businesses in this industry, the analysis relies on four separate NAICS codes: New Single Family Housing Construction (NAICS 236115), New Multifamily Housing Construction (NAICS 236116), New Housing Operative Builders (NAICS 236117), and Land Subdivision (NAICS 237210).

<sup>276</sup> Weighted average annual revenues are calculated using the average annual revenue reported for each small entity size class for the four development NAICS codes. These averages are then weighted based on the number of entities

22. In addition, we forecast approximately seven consultations on development activities in occupied habitat over the 20-year period, of which two may occur in a single year. These consultations are likely to be required even absent the designation of critical habitat. As a result, only the portion of administrative effort to address adverse modification of critical habitat is considered an incremental impact. The third-party impact associated with one consultation in occupied habitat is approximately \$880. We assume that each consultation will involve a separate entity. This impact thus represents less than 0.1 percent of average annual revenues for a small developer. Assuming up to three small entities participate in consultation in a single year in both occupied and unoccupied habitat, less than 0.2 percent of small developers within the study area may be affected.

#### Renewable Energy Development

23. Our analysis forecasts a single formal consultation for a wind energy project constructed by Eco-Power Wind Farms. This consultation will include either the Corps or the Federal Aviation Agency as the action agency. We expect that Eco-Power Wind Farms will participate as a third party. Because this project is located in occupied habitat, incremental impacts are limited to the portion of administrative effort to consider adverse modification of critical habitat. Because information on Eco-Power Wind Farms' annual electricity production is not available, we assume that total generation falls below the industry size standard of 4 million megawatt hours.<sup>277</sup> Third-party costs of consultation are approximately \$880. Revenue information for Eco-Power Wind Farms is not available. In order for impacts to reach one percent of annual revenues, Eco-Power Wind Farms would need to have annual revenues of less than \$88,000.

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reported for each size class. Data for this estimation is from Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2012-2013*, 2012.

<sup>277</sup> The corresponding NAICS code for wind electric power generation is 221115.

## EXHIBIT A-1. OVERVIEW OF SMALL ENTITIES WITHIN STUDY AREA

ACTIVITY	INDUSTRY (NAICS CODES)	SMALL ENTITY SIZE STANDARD	TOTAL NUMBER OF ENTITIES IN STUDY AREA	NUMBER OF SMALL ENTITIES IN STUDY AREA	PERCENT SMALL ENTITIES IN STUDY AREA
[A]	[B]	[C]	[D]	[E]	[F]=[E]/[D]
Grazing	Beef Cattle Ranching and Farming (112111)	\$750,000	118	112	95%
Water Management	Water Supply and Irrigation Systems (221310)	\$7.0 million	94	91	97%
Mineral and Fossil Fuel Extraction	Oil and Gas Extraction (211)	500 employees	23	11	48%
	Potash, Soda, and Borate Mineral Mining (212391)	500 employees	1	1	100%
Development	New Single-Family Housing Construction (236115)	\$33.5 million	1,446	1,444	100%
	New Multifamily Housing Construction (236116)	\$33.5 million	118	118	100%
	New Housing Operative Builders (236117)	\$33.5 million	18	18	100%
	Land Subdivision (237210)	\$7.0 million	160	160	100%
Renewable Energy	Wind Electric Power Generation (221115)	4 million MWH	1	1	100%

Source: Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifier," on May 27, 2013.

**Notes:**

1. The total number of entities in the study area was calculated by querying the Dun and Bradstreet database to identify the number of entities in the relevant NAICS codes for each industry across all counties within proposed critical habitat (Grand and San Juan Counties, Utah; Chaffee, Delta, Dolores, Gunnison, Hinsdale, Mesa, Montrose, Ouray, Saguache, and San Miguel Counties, Colorado).
2. The total number of small entities in the study area was calculated by querying the Dun and Bradstreet database to identify the number of entities falling under the small entity size standard for the relevant NAICS code as developed by the Small Business Administration.

## EXHIBIT A-2. SUMMARY OF FORECAST IMPACTS TO THIRD-PARTY PARTICIPANTS IN SECTION 7 CONSULTATION

ACTIVITY	TYPE OF IMPACT	AFFECTED ENTITIES (NAICS CODE)	SMALL ENTITIES AFFECTED IN ONE YEAR <sup>1</sup>	% OF SMALL ENTITIES	ANNUAL INCREMENTAL IMPACTS <sup>2,3</sup>	IMPACTS PER ENTITY	ANNUAL REVENUES PER SMALL ENTITY <sup>4</sup>	IMPACTS AS % OF REVENUES
Grazing	Project Modifications	Beef Cattle Ranching and Farming (112111)	63	56%	\$1.1 million	\$7,500	\$410,000	1.8%
Water Management	Administrative Impacts	Upper Gunnison River Water Conservancy District	1	1%	\$880	\$880	Unknown	Unknown
Mineral and Fossil Fuel Extraction	Administrative Impacts	Oil and Gas Extraction (211)	5-9	39% - 82%	\$17,000	\$880 - \$2,600	\$7.3 million	0.01% - 0.04%
	Administrative Impacts	RM Potash	1	100%	\$2,600	\$2,600	\$560,000	0.5%
Development	Project Modifications and Administrative Impacts	New Single-Family Housing Construction (236115); New Multifamily Housing Construction (236116); New Housing Operative Builders (236117); Land Subdivision (237210)	1-3	0.2%	\$880 - \$11,000	\$880 - \$11,000	\$4.4 million	<0.1% - 0.3%
Renewable Energy	Administrative Impacts	Eco-Power Wind Farms	1	100%	\$880	\$880	Unknown	Unknown

## Notes:

5. Detailed analysis presented in the text of the appendix.
6. As estimated in Chapters 3 through 8.
7. This estimate excludes the additional incremental costs of consultation that would be borne by the Federal action agency and the Service.
8. For grazing, oil and gas extraction, and development, weighted average annual revenues are estimated using Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2012 to 2013*, 2012. Revenue levels are discussed in greater detail in the text of this Appendix. Listed revenue for RM Potash is from Red Metal Limited. *Annual Report*. 2012.

**A.2 UMRA ANALYSIS**

24. Title II of UMRA requires agencies to assess the effects of their regulatory actions on state, local, and Tribal governments and the private sector.<sup>278</sup> Under Section 202 of UMRA, the Service must prepare a written statement, including a cost-benefit analysis, for rules that may result in the expenditure by state, local, and Tribal governments, in the aggregate, or by the private sector of \$100 million or more in any one year. If a written statement is needed, Section 205 of UMRA requires the Service to identify and consider a reasonable number of regulatory alternatives. The Service must adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule, unless the Secretary publishes an explanation of why that alternative was not adopted. The provisions of Section 205 do not apply when they are inconsistent with applicable law.
25. As stated in the Proposed Rule, “the designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.”<sup>279</sup> Therefore, this rule does not place an enforceable duty upon state, local, or Tribal governments, or the private sector.

**A.3 FEDERALISM IMPLICATIONS**

26. Executive Order 13132, entitled “Federalism,” requires the Service to develop an accountable process to ensure “meaningful and timely input by state and local officials in the development of regulatory policies that have federalism implications.”<sup>280</sup> “Policies that have federalism implications” are defined in the Executive Order to include regulations that have “substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.”<sup>281</sup> Under Executive Order 13132, the Service may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the compliance costs incurred by state and local governments, or the Service consults with state and local officials early in the process of developing the regulation.

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<sup>278</sup> 2 U.S.C. §§ 1531 et seq.

<sup>279</sup> 2013 Proposed Rule. 78 FR 2560.

<sup>280</sup> 64 FR 43255.

<sup>281</sup> *Ibid.*

27. This Proposed Rule does not have direct federalism implications. The designation of critical habitat directly affects only the responsibilities of Federal agencies. As a result, the Proposed Rule does not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government, as specified in the Executive Order.
28. State or local governments may be indirectly affected by the proposed designation if they require Federal funds or formal approval or authorization from a Federal agency as a prerequisite to conducting an action. In these cases, the state or local government agency may participate in the section 7 consultation as a third party. As discussed in Chapter 2, one of the key conclusions of the economic analysis is that we do not expect critical habitat designation to generate additional requests for project modifications in proposed occupied habitat. Section 7-related incremental impacts of the designation will likely be limited to additional administrative costs to the Service, Federal agencies and third parties of considering critical habitat during consultation, as well as potential project modifications in unoccupied habitat. In the context of the Proposed Rule, impacts to state and local governments are most likely to be associated with informal consultations for transportation projects on non-Federal lands. We forecast approximately 14 informal consultations in unoccupied habitat per year. We do not forecast impacts associated with conservation efforts as a result of these consultations. As a result, the proposed designation of critical habitat is not expected to have substantial direct impacts on state or local governments.

**A.4 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY**

29. 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.”<sup>282</sup>
30. 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;

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<sup>282</sup> U.S. Office of Management and Budget, Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27. July 13, 2001. Accessed at: <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.



- Reductions in natural gas production in excess of 25 million Mcf per year;
- Reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity;
- Increases in energy use required by the regulatory action that exceed the thresholds above;
- Increases in the cost of energy production in excess of one percent;
- Increases in the cost of energy distribution in excess of one percent; or
- Other similarly adverse outcomes.<sup>283</sup>

31. As presented in Chapter 5, we do not anticipate additional conservation efforts related to oil and gas beyond those requested to avoid jeopardy to the species. Incremental effects of the Proposed Rule are assumed to occur for energy projects in unoccupied sage-grouse habitat. Approximately 31 producing or newly permitted wells are located within unoccupied portions of the proposed designation. According to information from CERI, approximately 28,000 wells in the State of Colorado produced 1.3 billion Mcf-equivalents in 2005.<sup>284</sup> The number of wells within the proposed designation therefore represents less than one percent of wells in the State of Colorado. We do not anticipate that the designation of critical habitat will result in significant impacts to the energy industry on a national scale.

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<sup>283</sup> *Ibid.*

<sup>284</sup> Colorado Energy Research Institute, Colorado School of Mines. Oil and Gas Economic Impact Analysis. June 2007.

**APPENDIX B | SENSITIVITY OF RESULTS TO DISCOUNT RATE**

1. This appendix first summarizes baseline and incremental impacts calculated assuming a three percent discount rate. We provide these exhibits to demonstrate the sensitivity of our results to the discount rate selected. They can be compared with similar exhibits in the Executive Summary and Chapters 3-8 that present results assuming a seven percent discount rate. We also present the stream of undiscounted costs by economic activity.

**EXHIBIT B-1. FORECAST BASELINE IMPACTS BY UNIT, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$2,300,000	\$150,000
Piñon Mesa	\$2,100,000	\$140,000
San Miguel Basin	\$1,000,000	\$66,000
Cerro Summit-Cimarron-Sims Mesa	\$430,000	\$28,000
Crawford	\$3,000,000	\$200,000
Gunnison Basin	\$2,700,000	\$180,000
Poncha Pass	\$830,000	\$54,000
<b>Total</b>	<b>\$12,000,000</b>	<b>\$810,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-2. FORECAST INCREMENTAL IMPACTS BY UNIT, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$2,300,000	\$150,000
Piñon Mesa	\$610,000	\$40,000
San Miguel Basin	\$520,000	\$34,000
Cerro Summit-Cimarron-Sims Mesa	\$150,000	\$9,700
Crawford	\$940,000	\$61,000
Gunnison Basin	\$210,000	\$14,000
Poncha Pass	\$31,000	\$2,000
<b>Total</b>	<b>\$4,700,000</b>	<b>\$310,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-3. FORECAST BASELINE IMPACTS TO GRAZING ACTIVITIES, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$150,000	\$9,600
Piñon Mesa	\$190,000	\$12,000
San Miguel Basin	\$54,000	\$3,500
Cerro Summit-Cimarron-Sims Mesa	\$17,000	\$1,100
Crawford	\$150,000	\$9,800
Gunnison Basin	\$650,000	\$43,000
Poncha Pass	\$28,000	\$1,800
<b>Total</b>	<b>\$1,200,000</b>	<b>\$81,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-4. FORECAST INCREMENTAL IMPACTS TO GRAZING ACTIVITIES, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$150,000	\$9,500
Piñon Mesa	\$580,000	\$38,000
San Miguel Basin	\$330,000	\$21,000
Cerro Summit-Cimarron-Sims Mesa	\$21,000	\$1,400
Crawford	\$56,000	\$3,600
Gunnison Basin	\$16,000	\$1,100
Poncha Pass	\$12,000	\$760
<b>Total</b>	<b>\$1,200,000</b>	<b>\$75,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-5. FORECAST BASELINE IMPACTS TO TRIBAL ACTIVITIES, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$0	\$0
Piñon Mesa	\$0	\$0
San Miguel Basin	\$0	\$0
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0
Crawford	\$0	\$0
Gunnison Basin	\$15,000	\$980
Poncha Pass	\$0	\$0
<b>Total</b>	<b>\$15,000</b>	<b>\$980</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-6. FORECAST INCREMENTAL IMPACTS TO TRIBAL ACTIVITIES, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$0	\$0
Piñon Mesa	\$0	\$0
San Miguel Basin	\$0	\$0
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0
Crawford	\$0	\$0
Gunnison Basin	\$5,000	\$330
Poncha Pass	\$0	\$0
<b>Total</b>	<b>\$5,000</b>	<b>\$330</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-7. FORECAST BASELINE IMPACTS TO GRAZING ACTIVITIES, INCLUDING TRIBAL IMPACTS, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$150,000	\$9,600
Piñon Mesa	\$190,000	\$12,000
San Miguel Basin	\$54,000	\$3,500
Cerro Summit-Cimarron-Sims Mesa	\$17,000	\$1,100
Crawford	\$150,000	\$9,800
Gunnison Basin	\$670,000	\$44,000
Poncha Pass	\$28,000	\$1,800
<b>Total</b>	<b>\$1,300,000</b>	<b>\$82,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-8. FORECAST INCREMENTAL IMPACTS TO GRAZING ACTIVITIES, INCLUDING TRIBAL IMPACTS, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$150,000	\$9,500
Piñon Mesa	\$580,000	\$38,000
San Miguel Basin	\$330,000	\$21,000
Cerro Summit-Cimarron-Sims Mesa	\$21,000	\$1,400
Crawford	\$56,000	\$3,600
Gunnison Basin	\$21,000	\$1,400
Poncha Pass	\$12,000	\$760
<b>Total</b>	<b>\$1,200,000</b>	<b>\$76,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-9. FORECAST BASELINE IMPACTS TO AGRICULTURAL AND WATER MANAGEMENT ACTIVITIES, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$19,000	\$1,300
Piñon Mesa	\$5,900	\$380
San Miguel Basin	\$6,100	\$400
Cerro Summit-Cimarron-Sims Mesa	\$3,100	\$200
Crawford	\$3,400	\$220
Gunnison Basin	\$30,000	\$2,000
Poncha Pass	\$1,000	\$67
<b>Total</b>	<b>\$69,000</b>	<b>\$4,500</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-10. FORECAST INCREMENTAL IMPACTS TO AGRICULTURAL AND WATER MANAGEMENT ACTIVITIES, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$6,500	\$420
Piñon Mesa	\$2,000	\$130
San Miguel Basin	\$2,000	\$130
Cerro Summit-Cimarron-Sims Mesa	\$1,000	\$68
Crawford	\$1,100	\$74
Gunnison Basin	\$10,000	\$660
Poncha Pass	\$340	\$22
<b>Total</b>	<b>\$23,000</b>	<b>\$1,500</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		



**EXHIBIT B-11. FORECAST BASELINE ADMINISTRATIVE IMPACTS TO MINERAL AND FOSSIL FUEL EXTRACTION, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$240,000	\$15,000
Piñon Mesa	\$0	\$0
San Miguel Basin	\$350,000	\$23,000
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0
Crawford	\$0	\$0
Gunnison Basin	\$0	\$0
Poncha Pass	\$0	\$0
<b>Total</b>	<b>\$580,000</b>	<b>\$38,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-12. FORECAST INCREMENTAL ADMINISTRATIVE IMPACTS TO MINERAL AND FOSSIL FUEL EXTRACTION, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$1,400,000	\$93,000
Piñon Mesa	\$0	\$0
San Miguel Basin	\$120,000	\$7,600
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0
Crawford	\$0	\$0
Gunnison Basin	\$0	\$0
Poncha Pass	\$0	\$0
<b>Total</b>	<b>\$1,500,000</b>	<b>\$99,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-13. FORECAST BASELINE IMPACTS TO DEVELOPMENT BY SOURCE, 2013-2032  
(2012\$, 3% DISCOUNT RATE)**

UNIT	ADMINISTRATIVE COSTS		LAND SET-ASIDES	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$9,500	\$620	\$14,000	\$920
Piñon Mesa	\$370	\$24	\$550	\$36
San Miguel Basin	\$15,000	\$980	\$22,000	\$1,500
Cerro Summit-Cimarron-Sims Mesa	\$4,200	\$270	\$6,300	\$410
Crawford	\$1,500	\$95	\$2,200	\$140
Gunnison Basin	\$54,000	\$3,500	\$80,000	\$5,200
Poncha Pass	\$1,600	\$110	\$2,400	\$160
<b>Total</b>	<b>\$86,000</b>	<b>\$5,600</b>	<b>\$130,000</b>	<b>\$8,400</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.				

**EXHIBIT B-14. FORECAST INCREMENTAL IMPACTS TO DEVELOPMENT BY SOURCE, 2013-2032  
(2012\$, 3% DISCOUNT RATE)**

UNIT	ADMINISTRATIVE COSTS		LAND SET-ASIDES	
	PRESENT VALUE	ANNUALIZED	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$39,000	\$2,600	\$54,000	\$3,500
Piñon Mesa	\$490	\$32	\$550	\$36
San Miguel Basin	\$31,000	\$2,000	\$39,000	\$2,600
Cerro Summit-Cimarron-Sims Mesa	\$6,300	\$410	\$7,300	\$470
Crawford	\$6,000	\$390	\$8,200	\$530
Gunnison Basin	\$31,000	\$2,000	\$20,000	\$1,300
Poncha Pass	\$3,600	\$240	\$4,600	\$300
<b>Total</b>	<b>\$120,000</b>	<b>\$7,700</b>	<b>\$130,000</b>	<b>\$8,700</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.				

**EXHIBIT B-15. FORECAST BASELINE IMPACTS TO RESIDENTIAL AND RELATED DEVELOPMENT, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$24,000	\$1,500
Piñon Mesa	\$920	\$60
San Miguel Basin	\$37,000	\$2,400
Cerro Summit-Cimarron-Sims Mesa	\$10,000	\$680
Crawford	\$3,600	\$240
Gunnison Basin	\$130,000	\$8,800
Poncha Pass	\$4,100	\$270
<b>Total</b>	<b>\$210,000</b>	<b>\$14,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-16. FORECAST INCREMENTAL IMPACTS TO RESIDENTIAL AND RELATED DEVELOPMENT, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$94,000	\$6,100
Piñon Mesa	\$1,000	\$68
San Miguel Basin	\$70,000	\$4,600
Cerro Summit-Cimarron-Sims Mesa	\$14,000	\$880
Crawford	\$14,000	\$920
Gunnison Basin	\$51,000	\$3,400
Poncha Pass	\$8,200	\$540
<b>Total</b>	<b>\$250,000</b>	<b>\$16,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-17. FORECAST BASELINE IMPACTS TO RENEWABLE ENERGY DEVELOPMENT, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$15,000	\$980
Piñon Mesa	\$0	\$0
San Miguel Basin	\$0	\$0
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0
Crawford	\$0	\$0
Gunnison Basin	\$0	\$0
Poncha Pass	\$0	\$0
<b>Total</b>	<b>\$15,000</b>	<b>\$980</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-18. FORECAST INCREMENTAL IMPACTS TO RENEWABLE ENERGY DEVELOPMENT, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$5,000	\$330
Piñon Mesa	\$0	\$0
San Miguel Basin	\$0	\$0
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0
Crawford	\$0	\$0
Gunnison Basin	\$0	\$0
Poncha Pass	\$0	\$0
<b>Total</b>	<b>\$5,000</b>	<b>\$330</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-19. FORECAST BASELINE IMPACTS TO RECREATION ACTIVITIES, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$150,000	\$9,900
Piñon Mesa	\$380,000	\$25,000
San Miguel Basin	\$130,000	\$8,800
Cerro Summit-Cimarron-Sims Mesa	\$24,000	\$1,600
Crawford	\$780,000	\$51,000
Gunnison Basin	\$520,000	\$34,000
Poncha Pass	\$99,000	\$6,500
<b>Total</b>	<b>\$2,100,000</b>	<b>\$140,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-20. FORECAST INCREMENTAL IMPACTS TO RECREATION ACTIVITIES, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$2,000	\$130
Piñon Mesa	\$4,900	\$320
San Miguel Basin	\$1,700	\$110
Cerro Summit-Cimarron-Sims Mesa	\$320	\$21
Crawford	\$10,000	\$660
Gunnison Basin	\$6,800	\$440
Poncha Pass	\$1,300	\$84
<b>Total</b>	<b>\$27,000</b>	<b>\$1,800</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-21. FORECAST BASELINE IMPACTS TO TRANSPORTATION ACTIVITIES, 2013-2032  
(2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$1,700,000	\$110,000
Piñon Mesa	\$1,600,000	\$100,000
San Miguel Basin	\$430,000	\$28,000
Cerro Summit-Cimarron-Sims Mesa	\$370,000	\$24,000
Crawford	\$2,100,000	\$140,000
Gunnison Basin	\$1,300,000	\$87,000
Poncha Pass	\$700,000	\$45,000
<b>Total</b>	<b>\$8,200,000</b>	<b>\$540,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

**EXHIBIT B-22. FORECAST INCREMENTAL IMPACTS TO TRANSPORTATION ACTIVITIES, 2013-2032 (2012\$, 3% DISCOUNT RATE)**

UNIT	PRESENT VALUE	ANNUALIZED
Monticello-Dove Creek	\$620,000	\$40,000
Piñon Mesa	\$20,000	\$1,300
San Miguel Basin	\$5,600	\$360
Cerro Summit-Cimarron-Sims Mesa	\$110,000	\$7,400
Crawford	\$850,000	\$56,000
Gunnison Basin	\$120,000	\$7,800
Poncha Pass	\$9,000	\$590
<b>Total</b>	<b>\$1,700,000</b>	<b>\$110,000</b>
<b>Note:</b> Entries may not sum to totals reported due to rounding. Estimates are rounded to two significant digits.		

EXHIBIT B-23. STREAM OF UNDISCOUNTED IMPACTS TO GRAZING ACTIVITIES (2012\$)

UNIT	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	2013	EACH YEAR 2014-2032	2013	EACH YEAR 2014-2032
Monticello-Dove Creek	\$146,888	\$0	\$145,796	\$0
Piñon Mesa	\$185,594	\$0	\$576,978	\$0
San Miguel Basin	\$53,547	\$0	\$327,587	\$0
Cerro Summit-Cimarron-Sims Mesa	\$17,192	\$0	\$21,097	\$0
Crawford	\$149,475	\$0	\$55,549	\$0
Gunnison Basin	\$654,942	\$0	\$16,205	\$0
Poncha Pass	\$28,336	\$0	\$11,704	\$0
<b>Total</b>	<b>\$1,235,973</b>	<b>\$0</b>	<b>\$1,154,915</b>	<b>\$0</b>

EXHIBIT B-24. STREAM OF UNDISCOUNTED IMPACTS TO TRIBAL ACTIVITIES (2012\$)

UNIT	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	2013	EACH YEAR 2014-2032	2013	EACH YEAR 2014-2032
Gunnison Basin	\$15,000	\$0	\$5,000	\$0

EXHIBIT B-25. STREAM OF UNDISCOUNTED IMPACTS TO AGRICULTURAL AND WATER MANAGEMENT ACTIVITIES (2012\$)

UNIT	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	2013	EACH YEAR 2014-2032	2013	EACH YEAR 2014-2032
Monticello-Dove Creek	\$19,396	\$0	\$6,465	\$0
Piñon Mesa	\$5,899	\$0	\$1,966	\$0
San Miguel Basin	\$6,143	\$0	\$2,048	\$0
Cerro Summit-Cimarron-Sims Mesa	\$3,114	\$0	\$1,038	\$0
Crawford	\$3,417	\$0	\$1,139	\$0
Gunnison Basin	\$30,155	\$0	\$10,052	\$0
Poncha Pass	\$1,026	\$0	\$342	\$0
<b>Total</b>	<b>\$69,150</b>	<b>\$0</b>	<b>\$23,050</b>	<b>\$0</b>



**EXHIBIT B-26. STREAM OF UNDISCOUNTED IMPACTS TO MINERAL AND FOSSIL FUEL EXTRACTION (2012\$)**

UNIT	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	2013	EACH YEAR 2014-2032	2013	EACH YEAR 2014-2032
Monticello-Dove Creek	\$15,399	\$15,399	\$106,756	\$91,756
Piñon Mesa	\$0	\$0	\$0	\$0
San Miguel Basin	\$22,574	\$22,574	\$7,637	\$7,637
Cerro Summit-Cimarron-Sims Mesa	\$0	\$0	\$0	\$0
Crawford	\$0	\$0	\$0	\$0
Gunnison Basin	\$0	\$0	\$0	\$0
Poncha Pass	\$0	\$0	\$0	\$0
<b>Total</b>	<b>\$37,973</b>	<b>\$37,973</b>	<b>\$114,394</b>	<b>\$99,394</b>

**EXHIBIT B-27. STREAM OF UNDISCOUNTED BASELINE IMPACTS TO RESIDENTIAL AND RELATED DEVELOPMENT (2012\$)**

YEAR	MONTICELLO -DOVE CREEK	PIÑON MESA	SAN MIGUEL BASIN	CERRO SUMMIT- CIMARRON -SIMS MESA	CRAWFORD	GUNNISON BASIN	PONCHA PASS	TOTAL
2013	\$1,097	\$59	\$37,400	\$698	\$213	\$44,334	\$252	\$84,052
2014	\$1,855	\$59	\$0	\$697	\$214	\$7,047	\$274	\$10,147
2015	\$1,086	\$59	\$0	\$695	\$215	\$7,136	\$292	\$9,484
2016	\$1,587	\$59	\$0	\$691	\$228	\$6,875	\$293	\$9,732
2017	\$1,629	\$59	\$0	\$693	\$240	\$6,934	\$296	\$9,851
2018	\$1,377	\$59	\$0	\$688	\$242	\$6,704	\$301	\$9,372
2019	\$973	\$59	\$0	\$706	\$243	\$7,632	\$305	\$9,918
2020	\$1,590	\$59	\$0	\$702	\$257	\$7,439	\$302	\$10,348
2021	\$1,394	\$59	\$0	\$686	\$258	\$6,653	\$309	\$9,359
2022	\$1,426	\$59	\$0	\$679	\$260	\$6,229	\$291	\$8,943
2023	\$2,030	\$59	\$0	\$682	\$260	\$6,367	\$273	\$9,671
2024	\$1,367	\$59	\$0	\$676	\$260	\$5,862	\$243	\$8,467
2025	\$2,040	\$59	\$0	\$678	\$261	\$5,929	\$247	\$9,213
2026	\$1,329	\$59	\$0	\$671	\$261	\$5,456	\$260	\$8,036
2027	\$1,551	\$59	\$0	\$670	\$260	\$5,418	\$252	\$8,209
2028	\$2,446	\$59	\$0	\$669	\$249	\$5,330	\$216	\$8,969
2029	\$1,061	\$59	\$0	\$668	\$225	\$5,226	\$210	\$7,450
2030	\$1,829	\$59	\$0	\$664	\$201	\$4,951	\$203	\$7,906
2031	\$1,874	\$68	\$0	\$662	\$196	\$4,983	\$227	\$8,010
2032	\$1,734	\$68	\$0	\$662	\$193	\$4,652	\$178	\$7,486

**EXHIBIT B-28. STREAM OF UNDISCOUNTED BASELINE IMPACTS TO RESIDENTIAL AND RELATED DEVELOPMENT (2012\$)**

YEAR	MONTICELLO -DOVE CREEK	PIÑON MESA	SAN MIGUEL BASIN	CERRO SUMMIT- CIMARRON -SIMS MESA	CRAWFORD	GUNNISON BASIN	PONCHA PASS	TOTAL
2013	\$4,717	\$67	\$7,456	\$912	\$930	\$8,260	\$532	\$22,874
2014	\$7,033	\$67	\$3,058	\$910	\$930	\$3,304	\$579	\$15,880
2015	\$4,571	\$67	\$3,864	\$907	\$929	\$3,335	\$620	\$14,292
2016	\$6,250	\$67	\$4,184	\$896	\$926	\$3,203	\$612	\$16,137
2017	\$6,316	\$67	\$4,402	\$900	\$929	\$3,274	\$605	\$16,494
2018	\$5,498	\$67	\$4,561	\$891	\$925	\$3,160	\$598	\$15,700
2019	\$4,247	\$67	\$4,833	\$935	\$945	\$3,707	\$591	\$15,324
2020	\$6,188	\$67	\$4,816	\$927	\$943	\$3,636	\$583	\$17,161
2021	\$5,754	\$67	\$4,914	\$889	\$926	\$3,155	\$597	\$16,302
2022	\$5,832	\$67	\$4,675	\$874	\$920	\$2,954	\$564	\$15,887
2023	\$7,782	\$67	\$4,685	\$882	\$924	\$3,068	\$557	\$17,963
2024	\$5,656	\$67	\$4,635	\$868	\$917	\$2,844	\$499	\$15,487
2025	\$7,796	\$67	\$4,504	\$872	\$919	\$2,886	\$495	\$17,538
2026	\$5,510	\$67	\$4,527	\$856	\$912	\$2,664	\$465	\$15,000
2027	\$6,204	\$67	\$4,515	\$852	\$910	\$2,630	\$477	\$15,654
2028	\$9,006	\$67	\$4,445	\$851	\$908	\$2,578	\$453	\$18,309
2029	\$4,641	\$67	\$4,475	\$848	\$904	\$2,567	\$441	\$13,943
2030	\$7,025	\$67	\$4,442	\$838	\$896	\$2,439	\$423	\$16,131
2031	\$7,174	\$77	\$4,423	\$834	\$894	\$2,398	\$457	\$16,257
2032	\$6,736	\$77	\$3,875	\$833	\$893	\$2,293	\$372	\$15,078

**EXHIBIT B-29. STREAM OF UNDISCOUNTED IMPACTS TO RENEWABLE ENERGY DEVELOPMENT (2012\$)**

UNIT	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	2013	EACH YEAR 2014-2032	2013	EACH YEAR 2014-2032
Monticello-Dove Creek	\$15,000	\$0	\$5,000	\$0

**EXHIBIT B-30. STREAM OF UNDISCOUNTED IMPACTS TO RECREATION ACTIVITIES (2012\$)**

UNIT	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	2013	EACH YEAR 2014-2032	2013	EACH YEAR 2014-2032
Monticello-Dove Creek	\$15,414	\$9,510	\$1,968	\$0
Piñon Mesa	\$38,560	\$23,791	\$4,923	\$0
San Miguel Basin	\$13,630	\$8,410	\$1,740	\$0
Cerro Summit-Cimarron-Sims Mesa	\$2,475	\$1,527	\$316	\$0
Crawford	\$79,218	\$48,878	\$10,113	\$0
Gunnison Basin	\$52,946	\$32,668	\$6,759	\$0
Poncha Pass	\$10,099	\$6,231	\$1,289	\$0
<b>Total</b>	<b>\$212,341</b>	<b>\$131,015</b>	<b>\$27,109</b>	<b>\$0</b>

**EXHIBIT B-31. STREAM OF UNDISCOUNTED IMPACTS TO TRANSPORTATION ACTIVITIES (2012\$)**

UNIT	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	2013	EACH YEAR 2014-2032	2013	EACH YEAR 2014-2032
Monticello-Dove Creek	\$150,645	\$109,322	\$53,053	\$39,279
Piñon Mesa	\$159,747	\$98,565	\$20,394	\$0
San Miguel Basin	\$43,576	\$26,887	\$5,563	\$0
Cerro Summit-Cimarron-Sims Mesa	\$29,996	\$23,965	\$9,232	\$7,222
Crawford	\$181,810	\$134,008	\$70,680	\$54,746
Gunnison Basin	\$128,017	\$84,444	\$21,352	\$6,827
Poncha Pass	\$70,693	\$43,618	\$9,025	\$0
<b>Total</b>	<b>\$764,483</b>	<b>\$520,808</b>	<b>\$189,299</b>	<b>\$108,074</b>

**APPENDIX C**

**INCREMENTAL EFFECTS MEMORANDUM**

# **Incremental Effects Memorandum for the Economic Analysis for the Proposed Rule to Designate Critical Habitat for the Gunnison sage-grouse**

February 25, 2013

## **Introduction**

The purpose of this document is to provide information to serve as a basis for conducting an economic analysis of the proposed critical habitat for the Gunnison sage-grouse (*Centrocercus minimus*).

Section 4(b)(2) of the Endangered Species Act (Act) requires the U.S. Fish and Wildlife Service (Service) to consider the economic, national security, and other impacts of designating a particular area as critical habitat. The Service may exclude an area from critical habitat if it determines that the benefits of exclusion outweigh the benefits of including the area as critical habitat, unless the exclusion will result in the extinction of the species. To support its weighing of the benefits of excluding versus including an area in critical habitat, the Service prepares an economic analysis for each proposed critical habitat rule describing and monetizing, where possible, the economic impacts (costs and benefits) of the designation.

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

There are a number of ways that designation of critical habitat could influence activities, but one of the important functions of this memo is to provide detailed information about the differences between actions required under ESA section 7 to avoid jeopardy to the species versus actions that may be required to avoid destruction or adverse modification of critical habitat. The Service is working to update the regulatory definition of adverse modification since it was invalidated by a prior court ruling. In the meantime, we will rely on guidance provided by the Director's December 9, 2004, Memorandum, *Application of the "Destruction or Adverse Modification" Standard under Section 7(a)(2) of the Endangered Species Act*. This 2004 memo explains that the "destruction or adverse modification" review should determine whether, with implementation of the proposed Federal action, "critical habitat would remain functional (or retain the current ability for the primary constituent elements to be functionally established) to serve the intended conservation role of the species." (p. 3). The information provided below identifies the possible economic impacts for the Gunnison sage-grouse under the two different section 7 consultation standards.

Most courts have held that the Service only needs to consider the incremental impacts imposed by the critical habitat designation over and above those impacts imposed as a result of listing the species. For example, the Ninth Circuit Court of Appeals reached this conclusion twice within the last few years, and the U.S. Supreme Court declined to hear any further appeal from those rulings. *Ariz. Cattle Growers' Ass'n v. Salazar*, 606 F.3d 116 (9<sup>th</sup> Cir. 2010), *cert. denied*, 179 L. Ed. 2d 300, 2011 U.S. LEXIS 1362, 79 U.S.L.W. 3475 (2011); *Home Builders Ass'n of N. Cal. v. United States Fish & Wildlife Serv.*, 616 F.3d 983 (9<sup>th</sup> Cir. 2010), *cert. denied*, 179 L. Ed. 2d 300, 2011 U.S. LEXIS 1362, 79 U.S.L.W. 3475 (2011).

However, the prevailing court decisions in the Tenth Circuit Court of Appeals do not allow the incremental analysis approach. Instead the Tenth Circuit requires that the Service conduct a broader analysis that considers “all of the impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes.” *New Mexico Cattle Growers Ass'n v. FWS*, 248 F.3d 1277, 1285 (10<sup>th</sup> Cir. 2001). More specifically, the Tenth Circuit has directed the Service to consider in its economic analysis both the baseline economic impacts imposed due to listing the species and the additional incremental economic impacts imposed by designating critical habitat. *Id.* This direction to perform a “co-extensive analysis” rather than an “incremental analysis” is relevant to economic analysis of the critical habitat designation for the Gunnison sage-grouse because the species is located in Colorado and Utah, both of which fall within the jurisdiction of the Tenth Circuit. Accordingly, the Service plans to use the information in this memorandum regarding the baseline economic impacts of listing the species and the additional incremental effects of designating critical habitat to perform a co-extensive analysis of the economic impacts of the proposed critical habitat designation.<sup>1</sup>

## Background

On September 15, 2010, the Service determined that listing the Gunnison sage-grouse as a threatened or endangered species was warranted but precluded by higher priority listing actions and the species was added to the candidate species list with a listing priority number of 2. On January 11, 2013, the Service proposed to list Gunnison sage-grouse as endangered (78 FR 2486)

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<sup>1</sup> The basis for the Tenth Circuit’s *New Mexico Cattle Growers* decision in 2001 was its conclusion that the regulatory definitions of “jeopardy” and “adverse modification” were virtually identical, with the result, according to the court, that doing only an incremental analysis rendered meaningless the requirement to consider the impacts of the critical habitat designation, as there were no incremental impacts to consider. *New Mexico Cattle Growers*, 248 F.3d at 1283-85. Subsequently, the Service adopted a different definition of “adverse modification,” see 2004 Memorandum described above, which has led the Ninth Circuit to conclude that the premise underlying the Tenth Circuit’s *New Mexico Cattle Growers* decision is no longer valid and that the Service may employ incremental analysis in determining the economic impacts of a critical habitat designation. *Ariz. Cattle Growers Ass'n v. Salazar*, 606 F.3d 1160, 1173 (9<sup>th</sup> Cir. 2010). Consistent with this view, the Service recently proposed revisions to its regulations for impact analyses of critical habitat that clarify that it is appropriate to consider the impacts of designation on an incremental basis notwithstanding the *New Mexico Cattle Growers* decision. 77 Fed. Reg. 51503, 51507 (Aug. 24, 2012). The proposed rule incorporating the incremental impact approach has not been finalized as of the date of this memorandum, however.



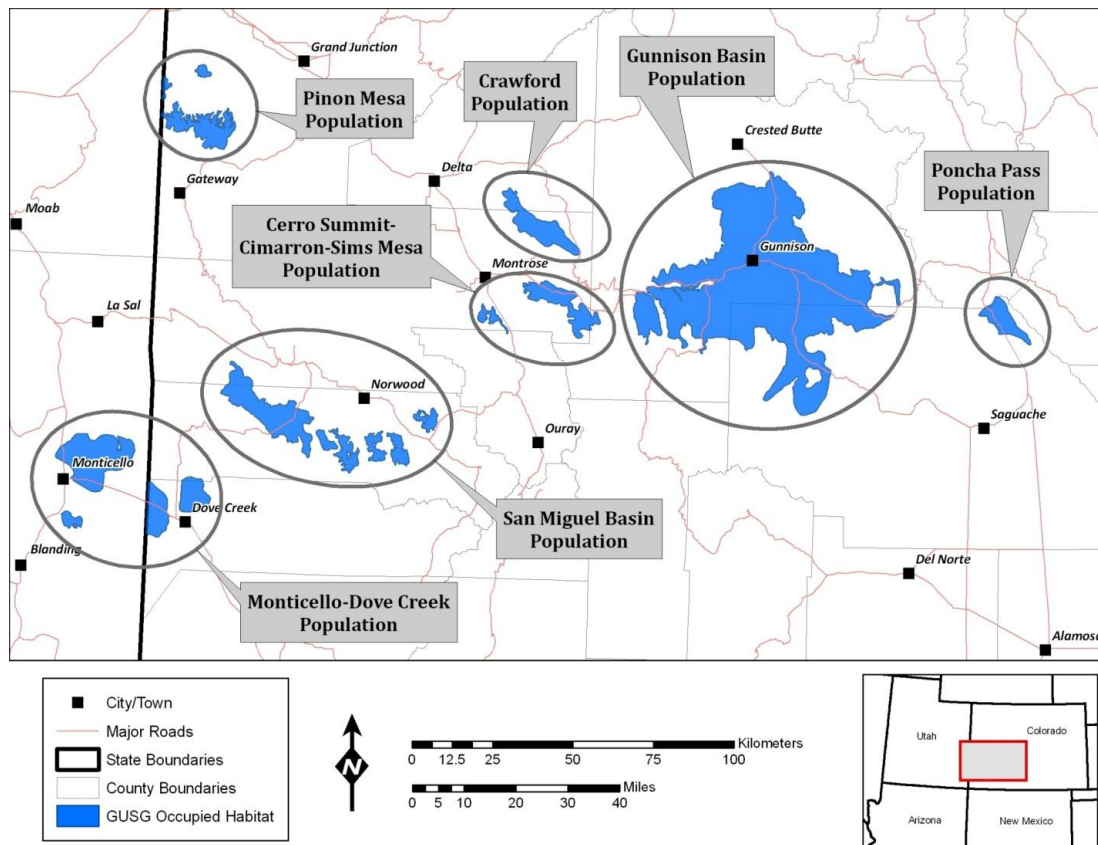
and concurrently proposed approximately 1.7 million acres of critical habitat for the species (78 FR 2540).

Gunnison sage-grouse and greater sage-grouse (a similar, closely related species) have similar life histories and habitat requirements (Young 1994, p. 44). Based on morphological, genetic, and behavioral differences as well as geographic isolation, the American Ornithologist's Union (2000, pp. 849-850) accepts the Gunnison sage-grouse as a distinct species. The current ranges of the two species do not overlap (Schroeder *et al.* 2004, p. 369).

Gunnison and greater sage-grouse depend on a variety of shrub-steppe habitats throughout their life cycle and are considered obligate users of several species of sagebrush (Patterson 1952, p. 42; Braun *et al.* 1976, p. 168; Schroeder *et al.* 1999, pp. 4-5; Connelly *et al.* 2000a, pp. 970-972; Connelly *et al.* 2004, p. 4-1, Miller *et al.* in press, p. 10). Large blocks of sagebrush-dominated habitats are needed. Dietary requirements of the two species are similar, being composed of nearly 100 percent sagebrush in the winter, and forbs and insects as well as sagebrush in the remainder of the year (Wallestad *et al.* 1975, p. 21; Schroeder *et al.* 1999, p. 5; Young *et al.* 2000, p. 452). In addition to serving as a primary year-round food source, sagebrush also provides cover for nests (Connelly *et al.* 2000a, pp. 970-971). Thus, sage-grouse distribution is strongly correlated with the distribution of sagebrush habitats (Schroeder *et al.* 2004, p. 364).

The Gunnison Sage-grouse Rangewide Steering Committee (GSRSC) (2005, p. 27-31) segregated habitat requirements into three seasons: (1) breeding (2) summer-late fall and (3) winter. Sage-grouse exhibit a polygamous mating system where a male mates with several females. Males perform courtship displays and defend their leks (Patterson 1952, p. 83). Lek displaying occurs from mid-March through late May, depending on elevation (Rogers 1964, p. 21; Young *et al.* 2000, p. 448).

Gunnison sage-grouse occupy approximately seven percent of the species' potential historic range. Gunnison sage-grouse currently occur in seven widely scattered and isolated populations in Colorado and Utah, occupying 3,795 square kilometers (km<sup>2</sup>) (1,511 square miles [mi<sup>2</sup>]) (Figure 1) (GSRSC 2005, pp. 36-37; CDOW 2009a, p. 1). The seven populations are Gunnison Basin, San Miguel Basin, Monticello-Dove Creek, Piñon Mesa, Crawford, Cerro Summit-Cimarron-Sims Mesa, and Poncha Pass. Of the estimated 940,000 acres (ac) (380,000 hectares [ha]) of rangewide occupied habitat, approximately 54 percent occurs on Federal lands; 41 percent occurs on private lands; and 5 percent occurs on state lands. The current rangewide population is estimated at approximately 4,621 individuals. The Gunnison Basin sage-grouse population contains approximately 593,000 acres (240,000 hectares) and over 87 percent of the total number of birds, and thus constitutes the largest remaining population.



**Figure 1. Gunnison sage-grouse occupied habitat and population areas.**

*Critical Habitat:* In total, the Service is proposing to designate 689,675 hectares (1,704,227 acres) as critical habitat for the Gunnison sage-grouse in Chaffee, Delta, Dolores, Gunnison, Hinsdale, Mesa, Montrose, Ouray, Saguache, and San Miguel Counties in Colorado, and in Grand and San Juan Counties in Utah (Figure 2, Table 1). The proposed critical habitat consists of seven units: (1) Monticello-Dove Creek, (2) Piñon Mesa (3) San Miguel Basin, (4) Cerro Summit-Cimarron-Sims Mesa, (5) Crawford, (6) Gunnison Basin, and (7) Poncha Pass (Figure 2). We consider approximately 55 percent of the area within the seven units as currently occupied and 45 percent as currently unoccupied. Approximately 48, 2, and 49 percent of proposed critical habitat occur on Federal, State, and private lands, respectively. Less than 1 percent occurs on city and county owned lands.

*Primary Constituent Elements (PCE):*

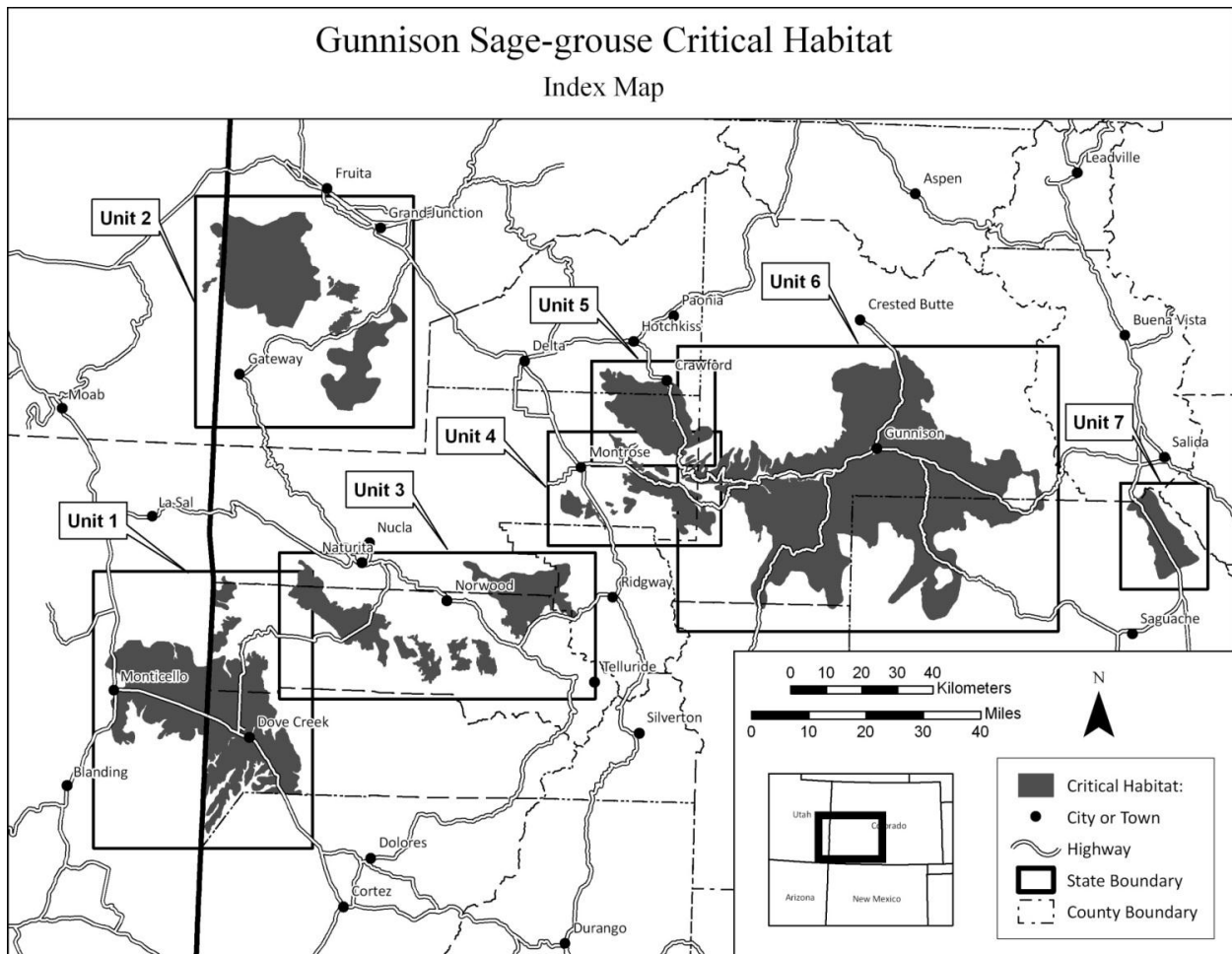
Under the ESA and its implementing regulations, the Service is required to identify the physical and biological features essential to the conservation of Gunnison sage-grouse in areas occupied at the time of listing, focusing on the features' primary constituent elements. *Primary constituent elements* are the elements of physical and biological features that, when laid out in the appropriate quantity and spatial arrangement to provide for a species' life-history processes, are essential to the conservation of the species.

The five PCEs for Gunnison sage-grouse critical habitat from the proposed rule include:

*Landscape-scale Primary Constituent Element*

- PCE 1: Sagebrush plant communities of sufficient size and configuration to encompass all seasonable habitats for a given population of GUSG and facilitate movement within and among populations. Specifically, this includes areas with at least 25 percent of primarily sagebrush land cover within a 1.5-km (0.9-mi) radius.
- *Site-Scale Primary Constituent Elements (Based on Vegetation Structural Characteristics)*
- PCE 2: Breeding Habitat – food, cover, reproduction
  - Overstory (shrub) – prefer slightly higher sagebrush cover during breeding season.
  - Understory (herbaceous) – prefer slightly higher herbaceous cover and height during breeding season.
- PCE 3: Summer-Late Fall Habitat – food, cover
- PCE 4: Winter Habitat – food, cover
- PCE 5: Alternative Habitats such as wet meadows, shrub riparian areas and agricultural fields – food

We only consider those areas as critical habitat if they meet the “Landscape-scale Primary Constituent Element” (PCE1) because small, isolated patches of sagebrush do not support Gunnison sage-grouse. If an area meets PCE1, then a particular site is considered critical habitat if it contains one or more of the “Site-scale Primary Constituent Elements” (PCEs 2-5). The Site-Scale Primary Constituent Elements are based on the Gunnison sage-grouse Rangewide Conservation Plan Structural Guidelines for important seasonal habitats. As such, these values are based on the most current and comprehensive, rangewide assessment of Gunnison sage-grouse.



**Figure 2. Proposed critical habitat units for Gunnison sage-grouse.**

**Table 1. Size and current occupancy status of Gunnison sage-grouse proposed critical habitat units. [Area estimates reflect all land within critical habitat unit boundaries.]**

Unit Name	Acres	Hectares	Percent of All Units	Occupied?	Acres	Hectares	Percent of Individual Unit	Percent of All Units
Monticello-Dove Creek	348,353	140,973	20.4	Yes	111,945	45,303	32.1	6.6
				No	236,408	95,671	67.9	13.9
Piñon Mesa	245,179	99,220	14.4	Yes	38,905	15,744	15.9	2.3
				No	206,274	83,476	84.1	12.1
San Miguel Basin	165,769	67,084	9.7	Yes	101,371	41,023	61.2	5.9
				No	64,398	26,061	38.8	3.8
Cerro Summit-Cimarron-Sims Mesa	62,708	25,377	3.7	Yes	37,161	15,038	59.3	2.2
				No	25,547	10,339	40.7	1.5
Crawford	97,123	39,304	5.7	Yes	35,015	14,170	36.1	2.1
				No	62,108	25,134	63.9	3.6
Gunnison	736,802	298,173	43.2	Yes	592,952	239,959	80.5	34.8
				No	143,850	58,214	19.5	8.4
Poncha Pass	48,292	19,543	2.8	Yes	20,416	8,262	42.3	1.2
				No	27,877	11,281	57.7	1.6
Totals	1,704,227	689,675	100.0		1,704,227	689,675	100.0	100.0

Note: Area sizes may not sum due to rounding.

*Land Use within proposed critical habitat:* Domestic livestock grazing occurs on virtually all public lands throughout the range of the species. In addition to grazing, recreation (motorized and non-motorized trail use) is prevalent on public lands in the Gunnison Basin. Agriculture in the form of grazed pastures and irrigated hay meadows is the dominant land use on private lands. On private lands in the Monticello-Dove Creek population, agriculture still dominates but is in the form of irrigated crops. The second dominant land use category on private lands throughout the range of the species is residential development (single family homes and rural residential). Commercial development does occur within the range of the species, but is minimal. Oil and gas development is not a dominant form of land use, except in a portion of the San Miguel Basin population.

*Special Management Considerations:* In general, the features essential to the conservation of Gunnison sage-grouse may require special management considerations or protection to reduce the following individual threats and their interactions: Residential and commercial development including associated land-clearing activities for the construction of access roads, utilities, and fences; increased recreational use of roads and trails; the proliferation of predators; improper grazing management, the spread of invasive plant species and associated changes in sagebrush plant community structure and dynamics; and other activities that result in the loss or degradation of sagebrush plant communities. The largest, overarching threat to Gunnison sage-grouse is habitat fragmentation.

Management activities that could ameliorate these threats include, but are not limited to: Comprehensive land-use planning and implementation that prevents a net decrease in the extent and quality of Gunnison sage-grouse habitat through the prioritization and protection of habitats and monitoring; protection of lands by fee title acquisition or the establishment of permanent conservation easements; management of recreational use to minimize direct disturbance and habitat loss; invasive weed and invasive native plant species control activities; management of domestic and wild ungulate use so that overall habitat meets or exceeds Gunnison sage-grouse

structural habitat guidelines; monitoring and management of predator communities; coordinated and monitored habitat restoration or improvement projects; and implementation of wild fire suppression, particularly in Wyoming big sagebrush plant associations. In some cases, current land management practices may be appropriate and beneficial for Gunnison sage-grouse. For instance, continued irrigation and maintenance of hay and alfalfa fields on private lands near sagebrush habitats may help provide or enhance brood-rearing, mesic habitats for Gunnison sage-grouse. The limited extent of sagebrush habitats throughout the species' current range emphasizes the need for additional habitat for the species to expand into so that it can survive and recover and adapt to changes in habitat that may result from climate change.

### **Baseline Analysis**

The following discussion describes the existing conservation efforts and regulatory mechanisms that are anticipated to provide protection to the Gunnison sage-grouse without critical habitat being designated.

Section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out in Gunnison sage-grouse habitat will not likely jeopardize the continued existence of the species. As described earlier, under the Service's standard incremental analysis of the impacts of critical habitat designation, impacts from this consultation requirement are considered part of the baseline of existing regulatory mechanisms and hence are not considered in identifying the incremental impact of the designation. For the reasons described earlier, however, the Service will analyze the impacts of designation for the Gunnison sage-grouse using the co-extensive impacts approach set forth in *New Mexico Cattle Growers Association v. USFWS*, 248 F.3d 1277 (10<sup>th</sup> Cir. 2001). Under this approach, impacts resulting from section 7 consultation under the jeopardy standard that are co-extensive with those that would result from consultation to ensure that the Federal action does not destroy or adversely modify critical habitat will not be considered part of the baseline condition.

#### *Conservation plans and regulatory mechanisms that provide protection to the species and its habitat without critical habitat designation*

The following are ongoing conservation efforts that provide some benefits to Gunnison sage-grouse and its habitat and are considered part of the baseline because these activities are occurring with or without critical habitat designation. If a specific plan is addressed in the item, we have indicated where it is available for review.

#### 1. Conservation Plans

*GUSG Rangewide Conservation Plan (RCP) and Local Working Group Plans*  
(<http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/Birds/Pages/GunnisonConsPlan.aspx>)

The RCP was completed in 2005 to provide a rangewide perspective for the long-term survival of Gunnison sage-grouse. Its foundation was the Local Working Group Conservation Plans, which are complete for six of the seven Gunnison sage-grouse populations (a conservation plan does not exist for the Cerro Summit-Cimarron-Simms

Mesa population). The purpose of the RCP is to protect, enhance, and conserve Gunnison sage-grouse populations and their habitats by providing rangewide guidance and recommendations to Local Working Groups and other stakeholders. Signatories to the plan include the Bureau of Land Management (Colorado and Utah), Colorado Parks and Wildlife, National Park Service, Natural Resources Conservation Service, U.S. Forest Service, Utah Division of Wildlife Resources, and the Service.

The RCP identifies and prioritizes rangewide and local strategies and responsibilities to address threats to GUSG. Examples of strategies and recommendations provided in the plan include livestock grazing methods, habitat treatment guidelines, inventory and monitoring, and others. The plan also provides other science-based recommendations including GUSG structural habitat guidelines (vegetation attributes for various seasonal habitats) and GUSG disturbance guidelines for land use practices (spatial and temporal restrictions to protect important habitat types). The six Local Working Group Plans are similar to the RCP but are more focused on population and site-specific issues and needs.

2. Candidate Conservation Agreement with Assurances (CCAA) for private property in Colorado—

In April 2005, the Colorado Division of Wildlife (CDOW) (hereafter, Colorado Parks and Wildlife (CPW)) applied to the Service for an Enhancement of Survival Permit for the Gunnison sage-grouse pursuant to section 10(a)(1)(A) of the Act. The permit application included a proposed Candidate Conservation Agreement with Assurances (CCAA) between CPW and the Service. The CCAA and environmental assessment were finalized in October 2006, and the associated permit was issued on October 23, 2006.

Private landowners with property occupied by Gunnison sage-grouse in southwestern Colorado can voluntarily enroll in the CCAA and associated permit through a Certificate of Inclusion by providing habitat protection or enhancement measures on their lands. If the Gunnison sage-grouse is listed under the Act, the CCAA remains in place and the permit authorizes incidental take of Gunnison sage-grouse due to otherwise lawful activities specified in the CCAA, when performed in accordance with the terms of the CCAA (e.g., crop cultivation, crop harvesting, livestock grazing, farm equipment operation, commercial/residential development, etc.), as long as the participating landowner is performing conservation measures voluntarily agreed to in the Certificate of Inclusion. Further, the CCAA provides assurance that landowners will not be subject to additional restrictions if the covered species becomes listed under the ESA or if critical habitat is designated.

As of the fall of 2012, 14 landowners have completed Certificates of Inclusion (CI) for their properties, enrolling a total of 13,200 ha (32,619 ac). Other properties currently going through the CCAA process (a total of 11,563 ha (28,573 ac) in Gunnison sage-grouse occupied habitat) include two properties under final review (406 ha (1,004 ac)); 12 properties in progress (10,322 ha (25,507 ac)); and five properties with completed baseline reports (834 ha (2,062 ac)). Completed and pending CI's combined would cover approximately 16 percent of the total private land throughout the species range. Permit holders and landowners can voluntarily opt out of the CCAA at any time.



### 3. Federal Laws, Regulations and Policy

GUSG are not currently protected under Federal law. However, the species' proposed endangered status and proposed critical habitat requires that Federal agencies ensure their projects do not jeopardize the species or result in destruction or adverse modification of critical habitat.

Federal agencies are responsible for managing 54 percent of GUSG rangewide occupied habitat. The Federal agencies with the most sagebrush habitat are BLM and the U.S. Forest Service (USFS). The National Park Service also manages lands that contain Gunnison sage-grouse habitat.

#### *BLM*

Rangewide, about 42 percent of Gunnison sage-grouse occupied habitat is on BLM-administered land. The Federal Land Policy and Management Act of 1976 (FLPMA) (43 U.S.C. 1701 et seq.) is the primary Federal law governing most land uses on BLM-administered lands. Section 102(a)(8) of FLPMA specifically recognizes wildlife and fish resources as being among the uses for which these lands are to be managed. BLM manages for Gunnison sage-grouse in its energy development, livestock grazing, wildlife habitat management, realty, travel, and other land use programs. Regulations pursuant to FLPMA and the Mineral Leasing Act (30 U.S.C. 181 et seq.) that address wildlife habitat protection on BLM-administered land include 43 CFR 3162.3–1 and 43 CFR 3162.5–1; 43 CFR 4120 et seq.; and 43 CFR 4180 et seq.

Gunnison sage-grouse were designated a BLM Sensitive Species when they were first recognized as a distinct species in 2000 (BLM 2009, p. 7). BLM Manual 6840–Special Status Species Management (BLM 2008, entire) states that “Bureau sensitive species will be managed consistent with species and habitat management objectives in land use and implementation plans to promote their conservation and to minimize the likelihood and need for listing under the ESA” (BLM 2008, p. 05V). The Manual further requires that Resource Management Plans (RMPs) address sensitive species, and that implementation “should consider all site-specific methods and procedures needed to bring species and their habitats to the condition under which management under the Bureau sensitive species policies would no longer be necessary” (BLM 2008, p. 2A1). As a designated sensitive species under BLM Manual 6840, Gunnison sage-grouse conservation needs are to be addressed in the development and implementation of RMPs on BLM lands.

#### *USFS*

Rangewide, the USFS manages 10 percent of the occupied Gunnison sage-grouse habitat. Management of National Forest System lands is guided principally by the National Forest Management Act (NFMA) (16 U.S.C. 1600–1614, August 17, 1974, as amended). The NFMA specifies that all National Forests must have a Land and Resource Management Plan (LRMP) (16 U.S.C. 1600) to guide and set standards for all natural resource management activities on each National Forest or National Grassland. The NFMA requires USFS to incorporate standards and guidelines into LRMPs (16 U.S.C. 1600). USFS conducts NEPA analysis on its LRMPs, which include provisions to manage plant

and animal communities for diversity, based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives. The USFS planning process is similar to that of BLM.

The Gunnison sage-grouse is a USFS sensitive species in both Region 2 (Colorado) and Region 4 (Utah). USFS policy provides direction to analyze potential impacts of proposed management activities to sensitive species in a biological evaluation. The National Forests within the range of sage-grouse provide important seasonal habitats for the species, particularly the Grand Mesa, Uncompahgre, and Gunnison (GMUG) National Forests.

Similar to BLM, the USFS manages for Gunnison sage-grouse in its various land use programs.

#### *NPS*

Rangewide, the NPS manages 2 percent of occupied Gunnison sage-grouse habitat, which means that there is little opportunity for the agency to affect range-wide conservation of the species. Lands in the Black Canyon of the Gunnison National Park and the Curecanti National Recreation Area include portions of occupied habitat of the Crawford and Gunnison Basin populations. The NPS Organic Act (39 Stat. 535; 16 U.S.C. 1, 2, 3, and 4) states that NPS will administer areas under their jurisdiction “by such means and measures as conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historical objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”

4. Federal Land and Resource Management Plans—  
RMPs and LRMPs are mechanisms through which adequate and enforceable protections for Gunnison sage-grouse could be implemented. The extent to which appropriate measures to reduce or eliminate threats to sage-grouse have been incorporated into those planning documents, or are being implemented, varies across the range.

#### *BLM*

The BLM in Colorado manages Gunnison sage-grouse habitat under five existing RMPs. All five RMPs, and their pending revisions, contain some specific measures or direction pertinent to management of Gunnison sage-grouse or their habitats. Three of these RMPs (San Juan, Grand Junction, and Uncompahgre—covering all or portions of the San Miguel, Piñon Mesa, Crawford, and Cerro Summit-Cimarron-Sims Mesa populations, and the Dove Creek group) are in various stages of revision. All RMPs currently propose some conservation measures (measures that if implemented should provide a level of benefit to Gunnison sage-grouse) outlined in the 2005 RCP (GSRSC 2005, entire) or local Gunnison sage-grouse working group conservation plans through project or activity level NEPA reviews (BLM 2009, p. 6). However, it is unknown which conservation measures will be adopted under the revised RMPs. The 2008 final RMP for the BLM Monticello Field Office in Utah incorporates the recommendations from the RCP,

providing a level of benefit for Gunnison sage-grouse. In addition, several offices have undergone other program-level planning, such as travel management, which incorporates some conservation for the species (BLM 2009, p. 6).

#### *USFS*

The National Forests within the range of sage-grouse provide important seasonal habitats for the species, particularly the Grand Mesa, Uncompahgre, and Gunnison (GMUG) National Forests. The 1991 Amended Land and Resource Management Plan for the GMUG National Forests does not contain Gunnison sage-grouse conservation measures or habitat objectives. However, the Regional Forester signed the 2005 RCP and as such has committed to follow and implement the plan and its strategies. A Proposed Forest Plan (revision) for the GMUG was released in March 2007. However, the Proposed Forest Plan process has been suspended due to a court injunction regarding implementation of the USDA 2005 Planning Rule. Therefore, it is unknown which conservation measures will be adopted in the Final Forest Plan.

#### *NPS*

Lands in the Black Canyon of the Gunnison National Park and the Curecanti National Recreation Area (NRA) include portions of occupied habitat of the Crawford and Gunnison Basin populations. The NPS's General Management Plan for the Black Canyon and Curecanti NRA (<http://www.nps.gov/blca/parkmgmt/index.htm>) does not identify specific conservation measures for Gunnison sage-grouse, but requires that endangered and threatened species are protected and that the NPS accomplishes its role in recovery of those species. However, this plan will be replaced with Resource Stewardship Strategies, to be developed in the next 5 to 7 years. In the meantime, NPS's ability to actively manage for Gunnison sage-grouse conservation is not limited by the scope of their management plan.

5. Gunnison sage-grouse local working groups meet regularly to discuss projects, issues, and opportunities, and have developed conservation plans (see number 1 above) for six of the seven GUSG populations.
6. The Service is coordinating with partners to design Federal projects and programs to benefit Gunnison sage-grouse (GUSG). For example, NRCS and the Service have initiated conferencing under section 7 of the Act for NRCS conservation programs that may affect GUSG. These efforts will also streamline ESA requirements and procedures if GUSG is listed.
7. Research by Colorado Parks and Wildlife, the U.S. Geological Survey, and academia continues to provide critical biological information for the species.
8. State Wildlife Laws  
States have the authority to regulate the possession of GUSG, set hunting seasons, and issue citations for poaching. These authorities provide the individual birds with protection from direct mortality from hunting. Hunting for GUSG does not currently occur, per

hunting season closures in Colorado and Utah. Both States will consider limited hunting of GUSG only if populations can be sustained.

The GUSG is listed as a species of special concern in Colorado, and a sensitive species in Utah. These designations provide higher priorities for management and protection of GUSG. The Colorado Oil and Gas Conservation Commission adopted rules in 2009 to address oil and gas development impacts on wildlife resources in the State. These rules can result in avoidance or minimization measures for oil and gas projects that may affect GUSG or its habitat. However, non-renewable energy development is not known to be a major threat to the species at this time.

State weed laws require landowners to control noxious weeds on their properties. These regulations may provide some level of conservation benefit to GUSG.

To date, the majority of conservation efforts have taken place in the Gunnison Basin population area. Once the Gunnison Basin CCA is completed, approximately 76 percent of total occupied habitat in the Gunnison Basin population area will be protected at some level via one or more of the above conservation tools. Protections are more limited in the remaining smaller populations. For example, in the San Miguel population area, the second largest GUSG population, only about 3% of occupied habitat is protected through these conservation tools.

*Federal agencies and other project proponents that are likely to consult with the Service under section 7 without critical habitat*

Because the Gunnison sage-grouse is not yet listed no section 7 consultations have been completed for the species. However, conferencing under section 7 is underway for several efforts, including NRCS conservation practices as described earlier and the Gunnison Basin Candidate Conservation Agreement for Federal lands (currently under development).

In the baseline scenario, 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 the Gunnison sage-grouse. Therefore, any activities that may affect Gunnison sage-grouse or its occupied habitat on Federal lands would require a section 7 consultation under the jeopardy standard. In addition, other Federal agencies funding or permitting work that would impact Gunnison sage-grouse or its habitat would also be required to consult on this basis. For example, Federal funding for NRCS conservation activities on private lands that support Gunnison sage-grouse or its habitat may require section 7 consultation.

Some of the Federal agencies and projects that would likely go through the section 7 consultation process whether or not critical habitat is designated include the following:

1. Bureau of Land Management (fire suppression, fuel-reduction treatments, land and resource management plans, livestock grazing and management plans, rights-of-way, recreation management, energy development).
2. U.S. Department of Transportation (highway and bridge construction and maintenance).

3. U.S. Fish and Wildlife Service (issuance of section 10 enhancement of survival permits, habitat conservation plans, and safe harbor agreements; Partners for Fish and Wildlife program projects benefiting Gunnison sage-grouse, Wildlife and Sportfish Restoration program).
4. U.S. Forest Service (vegetation management, noxious weed treatments, fire-management plans, fire suppression, fuel-reduction treatments, forest plans, livestock-grazing-allotment management plans, mining permits, travel-management plans).
5. Natural Resource Conservation Service (grazing management plans, Conservation Reserve Program management actions, sage-grouse conservation programs [However, if we include the GUSG in a conference opinion for all possible NRCS management actions then we would likely only do one programmatic consultation]).
6. National Park Service (habitat management, fire management, etc.)

If a Federal action impacts GUSG or its habitat (indirect effects to the species), the lead Federal agency will evaluate and determine the nature of those effects on the species. The lead Federal agency can determine that a proposed project has no effect to the sage-grouse in which case consultation is not necessary. However, if they conclude that the project may affect the sage-grouse then they are required to conduct section 7 consultation. If the project may affect, but is not likely to adversely affect the species because of insignificant, discountable, or wholly beneficial impacts, then only informal consultation is conducted and consultation will conclude with concurrence from the Service. However, if an agency determines that a proposed project is likely to adversely affect a species, formal consultation is conducted. Formal consultation results in a biological opinion that determines if the proposed project is likely to jeopardize the continued existence of the species. The Service works with Federal agencies on project siting, timing, and management practices during informal consultation to avoid adverse effects, so that formal consultation is not necessary.

*What types of project modifications are currently recommended or will likely be recommended by the Service to avoid jeopardy (i.e., the continued existence of the species)?*

Because the Gunnison sage-grouse is not yet listed, to date, there have been no section 7 consultations conducted by the Service that have resulted in a finding of jeopardy. For actions located on Federal lands, or subject to consultation through a Federal action (e.g. Federal permit, authorization, or funds), a jeopardy analysis for this species would examine the magnitude of a project's impacts relevant to the population and individuals across the species' entire range. Furthermore, the jeopardy analysis would focus on effects to the species' reproduction, numbers, or distribution.

To avoid jeopardy determinations, project proponents may be required, for example, to alter or site projects such that habitat impacts are avoided or minimized, conduct activities outside of crucial time-periods, and conduct habitat management actions in association with other

avoidance or minimization actions (i.e. reach a “may affect, not likely to adversely affect” determination as described above).

Recommendations for designing projects that could avoid jeopardy to Gunnison sage-grouse include:

1. Research and monitoring should be used to evaluate the efficacy of habitat treatments and measures intended to minimize or reduce impacts from project-related effects, but should not be used to offset actions that may result in loss, fragmentation, or modification of habitat.
2. All efforts should focus on preventing loss of Gunnison sage-grouse habitat. However, where occupied or unoccupied habitat is to be lost, modified, fragmented, or otherwise degraded, habitat should be replaced, permanently protected, and managed within close proximity to project impacts or within the same population or subpopulation area (or critical habitat unit). All efforts should strive to acquire, protect, restore, and manage compensation habitat prior to project initiation. Given these uncertainties and the available data, specific analyses must be conducted on a project-by-project basis to determine the amount of compensation habitat required to approach no net loss. For instance, a relatively high compensation ratio may be required if the affected habitat has a higher than average population density; if the habitat has been occupied over the long-term; if the habitat contains a large population; or if compensation lands are not nearby to affected habitat.
3. Permanent habitat loss, modification, or fragmentation resulting from agency actions should be offset with habitat that is permanently protected, including adequate funding to ensure the habitat is managed permanently for the protection of Gunnison sage-grouse.
4. Protection of off-site lands to mitigate habitat loss, modification, or fragmentation should not include lands already under some form of protection (e.g., guidance, land use decisions, or other regulatory mechanisms).
5. Areas slated for protection as a means of offsetting impacts to other lands should be identified using existing documents that have evaluated habitat conservation priorities rangewide; and should be conserved based on their relative value to the species.
6. Occupied breeding habitat is considered occupied year-round for project-related effects that degrade habitat quality.

### **Adverse Modification Analysis**

The following discussion describes the impacts that are anticipated with designation of critical habitat, as proposed, for the Gunnison sage-grouse. As we indicated in our proposed rule, we are

designating critical habitat including occupied and unoccupied areas. Once critical habitat is designated, section 7 of the Act requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat. As will be discussed in more detail below, the key factor for determining adverse modification is whether, with implementation of the proposed Federal action, the affected critical habitat will continue to have the capability to serve its intended conservation role for the species. From section 3(3) of the Act:

The terms “conserve,” “conserving,” and “conservation” mean to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided under the Endangered Species Act are no longer necessary.

Thus, designation of critical habitat helps ensure that proposed project actions will not result in the adverse modification of habitat to the point that the species will not achieve recovery, meaning they will not be capable of being removed from the threatened or endangered species list.

*What kinds of additional activities are likely to undergo consultation with critical habitat?*

Critical habitat units, including occupied and unoccupied portions, and their primary constituent elements (PCEs) reflect the needs of the species, and Federal actions impacting them would require consultation. Modifications to the PCEs are closely tied to adverse effects to the species, so that activities that would require consultation for occupied critical habitat would be no different than activities that currently require jeopardy consultation for the species. There may be some Federal activities that have potential to impact the species but not critical habitat. An example is Federal authorization of construction of an industrial facility on an area that does not contain PCEs but that would impede sage-grouse mating displays through high noise volume. However, any activity that impacts critical habitat would also impact the sage-grouse. However, currently unsuitable areas in unoccupied habitat proposed for critical habitat designation would not likely undergo consultation if not for the critical habitat designation. Portions of unoccupied habitat may include historical habitats, for example, that currently do not contain PCEs. It is plausible that Federal agencies would not consider the need for section 7 consultation in those areas if not for a critical habitat designation.

*How much administrative effort does or will the Service expend to address adverse modification in its section 7 consultations with critical habitat? Estimate the difference compared to baseline.*

The amount of increased administrative effort due to proposed critical habitat is difficult to foresee and quantify. When we complete a consultation for Gunnison sage-grouse with critical habitat, each consultation will evaluate whether that project would result in adverse modification. As a result, each formal consultation that “may affect” critical habitat has to consider adverse modification. Overall, we do not anticipate a substantial number of consultations that would



result in a finding of adverse modification and, therefore, we expect a nominal increase in administrative effort to develop measures to protect PCEs and avoid adverse modification. The majority of work we foresee due to critical habitat designation would be for unoccupied portions of critical habitat where, as noted above, Federal agencies might not ordinarily consider the effects of their actions on the species or its habitat.

*What project proponents are likely to pursue HCPs under section 10 after the designation of critical habitat?*

When a non-Federal entity voluntarily seeks coverage under the ESA, it is for incidental take of the species only. The internal Service section 7 consultation on the issuance of the HCP/incidental take permit addresses the potential for adverse modification of critical habitat within the HCP area.

Because the listing of Gunnison sage-grouse will be concurrent with this designation of critical habitat, several counties and local governments may be interested in pursuing HCPs. However, these HCPs will be prompted primarily by the listing action and not the critical habitat designation.

*What types of project modifications might the Service make during a section 7 consultation to avoid destruction or adverse modification of critical habitat that are different than those for avoiding jeopardy?*

When consulting with other agencies under section 7 of the Act in designated critical habitat, the Service conducts independent analyses for jeopardy and for adverse modification. Jeopardy occurs when an action is reasonably expected, directly or indirectly, to diminish a species' numbers, reproduction, or distribution so that the likelihood of survival and recovery in the wild is appreciably reduced (50 CFR 402.02). According to the Director's Memorandum of December 9, 2004 (Application of the "Destruction or Adverse Modification" Standard under Section 7(a)(2) of the Endangered Species Act), the analysis for "destruction or adverse modification of designated critical habitat" considers whether critical habitat would remain functional to serve the intended conservation role for the species.

Jeopardy and adverse modification are not equivalent standards; however, the outcome of section 7 consultations under these standards may be similar in some cases. Alterations of habitat that diminish the value of the habitat would result in adverse modification if the effect is severe enough to render the habitat incapable of providing its intended conservation function. If the action also would affect the remaining population, population size, reproduction, and recruitment to the extent that the likelihood of survival in the wild is appreciably reduced, a jeopardy determination also would result. Because the ability of this species to exist is closely tied to the quality of its habitat, significant alteration of its occupied habitat may result in jeopardy as well as adverse modification. Therefore, we anticipate that section 7 consultation analyses will result

in no differences between recommendations to avoid jeopardy or adverse modification in areas of critical habitat, except in unoccupied portions of critical habitat (see discussions above).

In section 7 consultations for proposed projects that may impact the species' habitat, a determination of adverse modification of critical habitat would usually be coincident to a jeopardy determination for the same action. Although independent analyses are made for jeopardy and adverse modification, most measures necessary to avoid adverse modification of critical habitat would avoid jeopardy as well. Therefore, the incremental cost differences of these consultations will likely be limited to administrative costs for occupied portions of critical habitat, but additive for those unoccupied portions of critical habitat.

If we determine that an adverse modification finding may be likely, we would recommend changes to the proposed action or may need to identify reasonable and prudent alternatives to eliminate or reduce the impacts. These measures or alternatives may modify the development project such that: (1) less land disturbance would occur within critical habitat; (2) the proposed action would be redesigned to avoid specific areas important to the species; (3) the proposed action would incorporate "best management practices" to protect habitat; and (4) the proposed action would include conservation measures to enhance and protect habitat within the critical habitat unit. These alternatives may have economic consequences to the local community.

We expect that for a proposed action to result in adverse modification (in other words substantially reduce the conservation value of critical habitat to reach recovery goals), it would likely have to dramatically alter a large proportion of Gunnison sage-grouse habitat by changing the physical and biological features and, thus, the PCEs. Following are potential project modifications that might be sought to avoid adverse modification:

- Modify grazing operations through fencing, reconfiguration of grazing units, off-site water development, and seasons of use.
- Modify ORV management through fencing, signage, education, areas and timing of use.
- Improve the development of native riparian vegetation through reducing land-and water-management stressors.
- Retain riparian vegetation.

### **Conclusion**

In summary, an incremental effect of the critical habitat designation in occupied and unoccupied critical habitat could occur by: (1) increased administrative costs of completing consultations for new projects in critical habitat units; and (2) possible project modifications to avoid adverse modification of critical habitat in areas where a significant alteration of habitat is proposed. Pursuant to the Tenth Circuit's *New Mexico Cattle Growers* decision, the economic impact of these incremental effects are to be considered in conjunction with other economic impacts of critical habitat designation that are attributable co-extensively to listing or other causes.

We appreciate the opportunity to provide this information for you. If you have any questions or request clarification of any the items described here, please do not hesitate to call Charlie Sharp at 970-243-2778x18.