Appendix 18

Social and Economic Impact Analysis Methodology and Economic Contribution Tables

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TABLE OF CONTENTS

Chapter Page

TABLES

Page

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Appendix 18. Social and Economic Impact Analysis Methodology

18.1 Introduction

This appendix describes the methods and data that underlie the social and economic impact analysis, the economic impact modeling analysis, and the environmental justice impact discussions. The social and economic impact analysis uses two general approaches. These are quantitative analysis and qualitative analysis. Input-output models such as the Impact Analysis for Planning (IMPLAN) model, an input-output (IO) model, provide a quantitative representation of the final demand and production relationships between individual economic sectors. This quantitative analysis approach is used when adequate information on physical production quantities and the prices and costs for goods and services is available. The first portion of the following discussion describes general aspects of the quantitative, qualitative, and environmental justice impact analysis methodologies. The quantitative methodology discussion describes the inputs required to run the IMPLAN model and how IMPLAN is used to estimate quantitative economic impacts. The resulting estimates from the IMPLAN model, by alternative, are in the Social and Economic Conditions (Including Environmental Justice) section of **Chapter 4**. The remaining sections provide additional detailed data used in the analysis for oil and gas, renewable energy (including geothermal, wind, and solar), and livestock grazing.

18.2 General Aspects of the Methodologies

18.2.1 Quantitative Economic Impact Analysis Using IMPLAN

A quantitative economic impact analysis was conducted for three resource uses: oil and gas development and production, geothermal development and production, and livestock grazing. Due to limitations on availability of data on production and quantity of market activities, analyses for nonenergy leasable minerals, locatable minerals, mineral materials, wind and solar energy, and greater sage grouse conservation were conducted qualitatively (see **Section 18.2.2**, Qualitative Economic and Social Impact Analysis, for discussion on the qualitative methodology used in the social and economic impacts analysis).

The basic approach used in quantitative economic impact analysis is to identify the economic sectors to be directly impacted and estimate the amount of direct economic activity likely to be affected by management decisions. For instance, management actions affecting oil and gas development on federal minerals could affect the Drilling Oil and Gas Wells sector if expenditures made by oil and gas companies to drill and complete new wells changes in response to these management actions. Potential direct impacts could also stem from changes in the amount of oil and gas produced. When direct impacts to economic activity can be quantified, they can be run through an economic input-output model to estimate the secondary economic activity that is generated as the direct impact ripples through the economy, "upstream" to providers of goods and services necessary for production, and "downstream" as income generated from production is spent by the households that receive the income.

The upstream, downstream, and total effects on economic activity are estimated through use of the IMPLAN model, an off-the-shelf input-output model that provides a mathematical accounting of the flow of money, goods, and services through a specified region's economy and yields estimates of gross economic output, jobs, and labor income. The model provides estimates of how economic activity (i.e., economic output, income, and employment) in one sector of the economy ripples through the broader economy, affecting seemingly unrelated sectors. These ripple effects include both indirect and induced impacts of proposed

management actions. Indirect impacts result from changes in economic activity in industries that sell inputs to the industries that may be directly impacted (for example, varying levels of economic output stemming from changes in supply purchases made by firms contracted to drill oil and gas wells). Induced impacts result from changes in household spending as households adjust their spending in response to increases or decreases in labor income supported by industries directly and indirectly affected by management actions (for example, changes in purchases at local stores for personal groceries).

This analysis used IMPLAN Cloud and data from IMPLAN's 2021data release. This means that parameters such as productivity and trade data reflect annual average economic conditions in the analysis areas during 2021. IMPLAN 2021 is the most recent vintage of data currently available in the IMPLAN Cloud platform. Prior to running the model, cost and price data were converted to a consistent dollar year (2023) using sector-specific adjustment factors from the IMPLAN model. Unless stated otherwise, the values in this appendix are expressed in year 2023 dollars.

Two models for each of the 10 states in the planning area were run, separately. The first model analyzed only the impacts on the counties in each state's analysis area, combined for each state. This provides information on the local economic contributions from direct economic changes in the analysis area, but it does not provide data on the economic contributions that result in other neighboring regions in the state from the direct changes in the analysis area. The second model took a multi-regional approach and analyzed the impacts on each state from direct impacts in the analysis area. The trade data available in the current version of IMPLAN (IMPLAN Cloud) make it possible to do multi-regional input-output (MRIO) analysis to track how an impact on any of the IMPLAN sectors in the identified socioeconomic analysis areas affects outputs in any of the sectors in other regions outside of the analysis area. For this analysis, this feature allowed the estimation of how an impact in the counties in the analysis area disperses into the counties in the rest of the state, and how these effects in the rest of the state create additional local effects in the analysis area. As a result, it was possible to estimate not only the jobs and income generation in the analysis area, but to also estimate how the economic activity in the analysis area affected jobs and income in each state as a whole.

The current IMPLAN model has 546 economic sectors, of which 507 are represented in the analysis area counties across all 10 states and 539 are represented across all counties in all states in the planning area (IMPLAN 2021 data).

Economic impacts were estimated and provided as an annual average over a 20-year time period (2023-2042). All dollar figures throughout the economic analysis area in constant 2023 dollars.

18.2.2 Qualitative Economic and Social Impact Analysis

The second methodological approach relies on qualitative discussions to describe potential economic and social impacts when impacts cannot be quantified. In such cases, the analysis describes the type of impact in a base scenario (in this planning effort, Alternative 1) and then assesses the relative changes in terms of increases or decreases in costs, the value of production, or differences in social conditions and changes in way of life for the communities across the analysis areas. This approach is used to describe potential impacts on market values, nonmarket values, and social conditions, which are all interconnected and discussed together by alternative.

Some of the management decisions under this planning action would result in increased costs to operators – the firms or individuals who undertake the activities – or to project proponents. The economic impacts of decisions that increase costs for operators and/or project proponents are many and can be complex.

Cost increases may cut into profitability and drive delays to, reductions in, or cessation of operations or projects. However, where operations or projects are not delayed, reduced, or terminated, increased costs also represent increased economic activity. For instance, if changes in ROW avoidance and exclusion areas under an alternative result in a change in solar plant siting and would require a new transmission line having to take a longer route, additional expenditures for materials, equipment, and labor would be made. These increased expenditures would support some amount of additional income and employment. However, increased costs may also represent opportunity costs; that is, the project proponent or society may have benefited more if the additional funds were used in another way. In the socioeconomic analysis in **Chapter 4**, where management actions would potentially increase costs to operators or project proponents, these increased costs are pointed out and discussed qualitatively. Readers should keep in mind that these increased costs reflect an opportunity cost which may negatively impact operators and be perceived as a benefit by others but may not be socially optimal overall.

Some effects associated with land management actions stem from changes in environmental goods and services that are not traded on traditional markets and whose value is not captured in standard measures of economic activity. Since these goods and services exist outside of observable markets, they lack prices that reveal people's willingness-to-pay for the benefits derived from them and are commonly referred to as nonmarket goods. The term "nonmarket values" refers to the benefits individuals derive from nonmarket goods, such as clean air and water, and healthy populations of wildlife. These values include the personal benefits derived from experiences in the natural environment or uses of natural and cultural resources. Nonmarket values also include passive use values (i.e., existence, option, and bequest) which are independent from the direct and indirect use of natural resources. Since these values are difficult to quantify because they cannot be estimated using observable market prices, qualitative discussions are essential to identifying and assessing impacts to nonmarket values in the planning process (see **Chapter 3** for more information on nonmarket values in the planning area).

Qualitative analysis is critical to understanding how management actions may affect social structures and values. While some social impacts stem from economic impacts, such as when changes in mineral payments and tax revenue impact the provisioning of public services and maintenance of infrastructure. Other potential impacts are social and cultural in nature and can affect quality of life, recreation and amenity values, and traditional land uses and associated cultural values. Social impacts stemming from BLM management decisions can vary considerably depending on the characteristics and diversity of the communities of interest that are involved. Additionally, the level of impacts is dependent on the degree to which new and revised management actions alter the course set in previous BLM decisions, and the degree to which local populations are dependent on BLM lands and resources. For a planning effort that covers 10 state analysis areas, analysis of social impacts must necessarily focus on broader discussion of impacts. As a result, in **Chapter 4**, a qualitative review is provided on potential social impacts resulting from changes in public service available for populations, based on anticipated changes to employment levels and tax revenues. These social impacts are discussed alongside the economic changes in employment, output, and tax revenues as well as the impacts on quality of life and non-market values associated with GRSG conservation as well as livestock grazing and wild horse and burros.

Additionally, the social impacts analysis addresses impacts based on the varying points of view of key types of communities of shared interest. **Chapter 3** and **Appendix 13**, Socioeconomics Baseline Report, identify several broad categories of communities of shared interest that could be impacted by sage-grouse management decisions in the planning area. These categories reflect different linkages people have to public land and reflect distinct sets of attitudes, beliefs, values, opinions, and perceptions about natural resources

and the effects of various management policies and actions. It should be noted that individuals and social groups may have multiple interests and often identify with more than one community of shared interest category. This categorization allows for differentiation of social impacts based on broad differences in points of view. The social impacts analysis in **Chapter 4** of the EIS assesses the alternatives against the different points of view in the broad communities of shared interest categories.

As mentioned above, impacts to market, nonmarket, and social conditions are interrelated, so in **Chapter 4**, they are discussed together for each resource use. The methodology and assumptions for each resource use are discussed below, in **Section 2.3**, Methodologies by Resource Use.

18.2.3 Environmental Justice Impact Analysis

Definitions and methods for analysis of potential environmental justice issues are described in **Appendix 13**, Socioeconomic Baseline Report. In short, the socioeconomic study area was screened to identify counties with minority, low-income, or American Indian and Alaska Native populations that qualify as potential environmental justice populations based on guidance for environmental justice analysis from the Council on Environmental Quality and the BLM (CEQ 1997, BLM 2022). These counties and their potential environmental justice populations are noted in **Chapter 3** of the EIS, as well as **Appendix 13**, Socioeconomic Baseline Report. The BLM reviewed public comments and issues of concern that were brought up in 2012 economic workshops and public scoping comments received in 2012, 2019, and for the current planning effort. These issues were considered for carrying forward for impact analysis based on the BLM-management decisions included under the alternatives for this planning effort. Assessment of the likelihood of disproportionate and adverse impacts to these populations was conducted as described in **Chapter 4** of the EIS.

18.3 Methodologies by Resource Use

18.3.1 Oil and Gas

The economic impact of oil and gas reflects drilling, completion, production and tax revenue activities, and changes in economic impacts of oil and gas stem from changes in these activities due to a change in the level of stipulations for the protection of Greater Sage-Grouse under each alternative. Under alternative 3, all areas managed for GRSG would be PHMA and fluid minerals in these areas would be closed to leasing (see **Section 4.9**, Mineral Resources, of this EIS for more details). Closing areas to fluid mineral leasing could result in impacts on level of oil and gas activities and associated jobs, income, and tax revenue supported by local operations. Under alternatives 1, 2, 4, 5, and 5a, all states include language to maintain and enhance sagebrush habitats with the intent of conserving sage-grouse populations; however, there would be fewer areas closed to leasing than under alternative 3 (the stipulations on oil and gas leasing and the areas closed to leasing for these alternatives vary by state and alternative and are described in detail in **Section 4.9**, Mineral Resources).

The estimated number of wells drilled and completed, and production from new wells were projected for a 20-year period (2023 to 2042) for each alternative and state as part of the Reasonably Foreseeable Development Scenario (see **Appendix 12**, Reasonably Foreseeable Development Scenario, which provides a complete description of the assumptions and methodology used in developing these estimates). These projections were used as inputs in IMPLAN to model the economic impacts of oil and gas development under each alternative.

Drilling and completion costs per well were developed from Spears & Associates, Inc.'s Drilling and Completion Services Cost Index.[1] These estimates were developed per state, and the weighted average costs were calculated based on the percentage of well type for each state.

Total regional expenditures from drilling costs are calculated by multiplying the drilling cost per well by the projected average annual number of new wells spud (see **Appendix 12**, Reasonably Foreseeable Development Scenario). The number of new wells spud per year is multiplied by the completion ratio (which is estimated by state based on historical completion rates) to calculate the average annual new wells completed. Total regional expenditures from completion costs are calculated by multiplying the average annual number of new wells completed each year by the completion cost per well. Total regional expenditures from drilling and completion costs were used as an input in IMPLAN to generate total regional output, employment, and earnings from oil and gas development.

Projected annual production for new wells developed from 2023 to 2043 is from the reasonably foreseeable development scenario (see **Appendix 12**, Reasonably Foreseeable Development Scenario). Projected oil and gas production under each alternative represents the forecast under varying levels of stipulations and restrictions on leasable mineral development. These stipulations and restrictions could deter operators from leasing, drilling, and producing oil and gas on BLM-administered lands. Instead, operators could choose to develop oil and gas on non-federal lands, or they could choose to reduce production altogether. For the purposes of this analysis, it is assumed that operators choose to reduce production rather than choose to develop on non-federal lands. This means the reported economic impacts associated with changes in federal mineral development may overstate the potential economic impacts within an analysis area due to the ability of some operators to shift operations to non-federal lands and minerals.

The market value of production per well from 2023 to 2043 was calculated using projected annual oil wellhead and natural gas supply prices, from the 2023 Annual Energy Outlook (AEO) reference case published by the US Energy Information Administration (EIA) (EIA 2023). The EIA forecasts oil and gas prices as an average across eight multi-state regions (EIA 2023). For the purposes of this analysis, the price used for each state was taken from the regional average where the state is located. **Table 1** shows the 20-year average price, from 2023 to 2042, for oil and gas for each state in the planning area.

Table 1. 20-Year Average Oil and Gas Prices, by State

State	Multi-State Region	Oil Wellhead Price ($/barrel)	Natural Gas Supply Price ($/thousand cubic feet)
California	West Coast	93.31	2.75
Colorado	Rocky Mountain	87.22	2.92
Idaho	Rocky Mountain	87.22	2.92
Montana	Northern Great Plains	87.22	3.79
Nevada	Rocky Mountain	87.22	2.92
North Dakota	Northern Great Plains	87.22	3.79
Oregon	West Coast	93.31	2.75
South Dakota	Northern Great Plains	87.22	3.79
Utah	Rocky Mountain	87.22	2.92
Wyoming	Rocky Mountain	87.22	2.92

Source: US EIA 2023

[1] These estimates for drilling and completion costs can be provided from the BLM upon request.

The pace and timing of mineral development activities is dependent on a variety of factors outside the management decisions of the BLM, some of which cannot be foreseen with reasonable certainty. These include national and international energy demand and prices, enactment of future laws and regulatory policies, global supply disruptions, technological advances, and business strategies of operators. The RFD projects future production based on expected rates of well drilling, estimated completion rates, and current production decline curves. Together these parameters allow for projection of future oil and gas production volumes for use in the economic impact analysis. Future real world economic impacts could vary if actual development or production varies from the projection schedule under the RFD, if prices change, or if there are significant structural changes within the oil and gas sector or the broader economies of these study areas.

The IMPLAN sector 35, drilling oil and gas wells, was used to model an exogenous change in demand for oil and gas well drilling. Sector 20, oil and gas extraction, was used to model a change in oil and gas production.

Changes in oil and gas development could also affect state and county public finances through disbursements of federal mineral leasing revenue or state severance taxes. The analysis of potential changes in federal mineral leasing payments is calculated from the projected production revenue and the federal royalty rate enacted in August 2022 (16.67 percent).[2] The impacts to the revenue from state severance taxes is calculated based on the severance tax rate for each state (see **Chapter 3**, Affected Environment, Social and Economic Conditions for the current severance tax assumptions by state).

Tax and royalty revenues derived from activities on BLM-administered lands and minerals would continue to have fiscal implications for communities within the socioeconomic analysis area, the state, and the Federal Government.

18.3.2 Locatable Minerals

The qualitative analysis of impacts on social and economic conditions due to potential changes in locatable minerals focuses on the impacts of proposed conservation measures to protect Greater Sage-Grouse under the alternatives. Under alternative 3, all PHMA would be recommended withdrawal from mineral entry (see **Section 4.9**, Mineral Resources, of this EIS for more details). Recommending areas for closure to the mining laws for locatable exploration or development does not restrict any activities and therefore, such recommendation does not have any impacts. However, the BLM could ask the Secretary of the Interior to propose and make a withdrawal of the land from location and entry under the Mining Law of 1872 pursuant to Section 204(a) of FLMPA. Proposing and making a withdrawal is not a land use planning process. Should the Secretary propose a withdrawal, the proposal would require environmental and other analysis under NEPA and other applicable authorities before the land could be withdrawn. For purposes of this planning initiative, the alternatives analysis includes a description of the likely environmental effects should the Secretary propose and make a withdrawal in the future (e.g., reduced potential for behavioral disturbance and habitat loss/alterations). If the Secretary ultimately decided to withdraw the land, under Alternative 3, such a withdrawal would likely result in impacts on the level of mineral extraction and associated jobs,

[2] The new rate (16.67 percent) only applies to federal leases issued after the IRA was signed. Many new wells development, and the production associated from these new wells, occur on these leases that were issued prior to August 2022 and the royalties from this production would be assessed based on the old rate of 12.5 percent. The approach to consistently use the new rate across all production from new wells means that actual disbursements of federal mineral leasing royalty revenue would likely be less that the results described in Chapter 4; however, the analysis can be used to compare the disbursements across alternatives. Additionally, the analysis on disbursements does not include other streams of federal mineral leasing revenue such as from rents and bonus bids as impacts from alternatives on rents and bonus bids are more uncertain.

income, and tax revenue supported by local mining operations. Under alternatives 1, 2, 4, 5, and 5a, actions would be taken to maintain and enhance sagebrush habitats with the intent of conserving sage-grouse populations; however, there would be fewer areas recommended for withdrawal than under alternative 3 (the areas recommended for withdrawal for these alternatives vary by state and alternative and are described in detail in **Section 4.9**, Mineral Resources).

18.3.3 Mineral Materials

The qualitative analysis of impacts on mineral materials are based on discussions of how changes in the acres available or unavailable for mineral material disposal, under each alternative, would impact mineral material extraction and costs associated with extraction, access to the resources, and transportation of minerals after they are extracted. Under alternative 3, all areas managed for GRSG would be PHMA and mineral materials would be closed to disposal in all PHMA (see **Section 4.9**, Mineral Resources, of this EIS for more details). Under alternatives 1, 2, 4, 5, and 5a, actions would be taken to maintain and enhance sagebrush habitats with the intent of conserving sage-grouse populations; however, there would be fewer areas closed to disposal than under alternative 3 (the areas closed to disposal for these alternatives vary by state and alternative and are described in detail in **Section 4.9**, Mineral Resources). Social impacts to communities due to availability of materials in free-use permits are also explored.

18.3.4 Renewable Energy (Geothermal, Wind, and Solar)

Geothermal

Economic impacts from changes geothermal exploration and development due to a change in the level of stipulations for the protection of Greater Sage-Grouse, under each alternative, are a function of construction and operation expenditures for geothermal electricity development, including drilling wells (exploratory, production, and injection), constructing power plants, and operating facilities. Under alternative 3, all areas managed for GRSG would be PHMA and these areas would be closed to all geothermal leasing (see **Section 4.9**, Mineral Resources, of this EIS for more details). Closing areas to geothermal leasing would result in impacts on level of geothermal activities and associated jobs, income, and tax revenue supported by local operations. Under alternatives 1, 2, 4, 5, and 5a, all states include language to maintain and enhance sagebrush habitats with the intent of conserving sage-grouse populations; however, there would be fewer areas closed to leasing than under alternative 3 (the stipulations on geothermal leasing and the areas closed to leasing for these alternatives vary by state and alternative and are described in detail in **Section 4.9**, Mineral Resources). In the Reasonably Foreseeable Development Scenarios for geothermal development, the BLM analyzed future leasing and development of federal geothermal resources within the decision area over the next 20 years for each alternative. The outputs from the scenarios in the Reasonably Foreseeable Development Scenarios on projected capacity and number of geothermal plants was used to model economic impacts from economic activity (see **Appendix 12**, Reasonably Foreseeable Development Scenarios for more details on how these projections were calculated).

To estimate economic activity associated with geothermal development, BLM used the National Renewable Energy Laboratory's Jobs and Economic Development Impact (JEDI) model (National Renewable Energy Laboratory 2016) to calculate the gross regional economic output, employment, and labor income associated with a representative power plant. The assumptions used 20 MW nameplate capacity for the analyses in Colorado, Idaho, Oregon, and Wyoming, 30 MW nameplate capacity for the analysis in Utah, and 28.8 MW nameplate capacity for the analysis in Nevada (based on the average plant capacity of existing geothermal plants in the planning area). BLM used standard assumptions from the National Renewable Energy Laboratory for the inputs, where data was not available. The economic impacts from the JEDI model were multiplied by

the number of geothermal power plants projected, as described in **Appendix 12**, Reasonably Foreseeable Development Scenarios.

The pace and timing of geothermal development activities is dependent on a variety of factors outside the management decisions of the BLM, some of which cannot be foreseen with reasonable certainty. These include demand for electricity, availability of transmission infrastructure capacity, geothermal energy prices relative to the prices for electricity from other sources, cost of energy generation technologies, technological advances, and business strategies of operators. The RFD projects future production based on expected rates of well drilling, estimated completion rates, and current production decline curves. Together these parameters allow for projection of future oil and gas production volumes for use in the economic impact analysis. Future real world economic impacts could vary if actual development or production varies from the projection schedule under the RFD, if prices change, or if there are significant structural changes within the oil and gas sector or the broader economies of these study areas.

Wind and Solar Energy

The qualitative analysis of impacts on wind and solar energy from BLM-management decisions are based on how the number of acres designated as ROW exclusion or ROW avoidance areas, under each alternative, would impact wind and solar energy development and costs associated with development and transmission of wind and solar energy. Under alternative 3, all PHMA would be managed as ROW exclusion (outside of designated corridors; see **Section 4.8**, Lands and Realty (Including Wind and Solar), of this EIS for more details). Under alternatives 1, 2, 4, 5, and 5a, actions would be taken to maintain and enhance sagebrush habitats with the intent of conserving sage-grouse populations; however, there would be fewer areas managed as ROW exclusion than under alternative 3 (the areas managed as ROW avoidance and exclusion under these alternatives vary by state and alternative and are described in detail in **Section 4.8**, Lands and Realty (Including Wind and Solar)).

The pace and timing of wind and solar energy development activities are dependent on a variety of factors outside the management decisions of the BLM. These include demand for electricity, availability of transmission infrastructure capacity, renewable energy prices relative to prices for electricity from other energy sources, costs of energy generation technologies, technological advances, and business strategies of operators. Due to uncertainties in these factors as well as data limitations, economic and social impacts on wind and solar energy from BLM-management decisions will be discussed qualitatively.

18.3.5 Livestock Grazing

Economic impacts from changes to livestock grazing are a function of the amount of forage utilization and the market value of livestock whose feed requirements are partially met through grazing on BLM managed allotments. Forage utilization is measured in animal unit months (AUMs), with one AUM defined as the amount of forage needed to feed a cow or five sheep for one month.

Two types of AUM measures are tracked: active AUMs, which measure the amount of forage from land available for grazing, and billed AUMs, which measure the amount of forage that the BLM bills for annually. For the purposes of the analysis in **Chapter 4**, impacts were estimated based on the 5-year average (2018-2022) of billed AUMs, which is the closest available proxy for actual forage use. Because billed use may exceed actual grazing use, the economic analyses may overstate the actual economic impacts of grazing to some degree; however, the comparison across alternatives is still representative of the impacts from BLM-management decisions.

The number of billed AUMS on allotments with greater than 15 percent PHMA land was determined by overlaying GIS data layers. The 5-year average total billed AUMs as well as the billed AUMs on allotments with greater than 15 percent PHMA land by livestock type and state were reported in **Appendix 13**, Socioeconomic Baseline Report. **Table 2** shows the estimated projected number of billed AUMs by alternative for each state, broken out by livestock type and total. The total billed AUMs and billed AUMs by livestock type for Alternatives 1, 2, 4, and 5 was assumed to be consistent with the 5-year average billed AUMs. Under Alternative 3, all of the allotments where PHMA accounts for 15 percent or more of the acreage would be completely closed to grazing, so the billed AUMs would be reduced to zero.

Table 2. Number of Estimated AUMs by Livestock Type, State, and Alternative[1]

State	Alternative	Total Billed AUMs	Billed AUMs by Livestock Type	
			Cattle	Sheep
California	Alternatives 1, 2, 4, and 5	121,325	115,259	6,066
	Alternative 3	0	0	0
Colorado	Alternatives 1, 2, 4, and 5	126,183	104,227	21,956
	Alternative 3	0	0	0
Idaho	Alternatives 1, 2, 4, and 5	741,979	696,719	45,261
	Alternative 3	0	0	0
Montana	Alternatives 1, 2, 4, and 5	885,551	866,954	18,597
	Alternative 3	0	0	0
Nevada	Alternatives 1, 2, 4, and 5	1,092,825	1,019,606	73,219
	Alternative 3	0	0	0
North Dakota	Alternatives 1, 2, 4, and 5	3,871	3,863	8
	Alternative 3	0	0	0
Oregon	Alternatives 1, 2, 4, and 5	678,191	674,122	4,069
	Alternative 3	0	0	0
South Dakota	Alternatives 1, 2, 4, and 5	35,588	31,638	3,950
	Alternative 3	0	0	0
Utah	Alternatives 1, 2, 4, and 5	258,438	201,840	56,598
	Alternative 3	0	0	0
Wyoming	Alternatives 1, 2, 4, and 5	1,334,637	1,190,497	144,141
	Alternative 3	0	0	0

Source: BLM 2023
— = Data not available
[1]Data reported is for allotments where PHMA accounted for 15 percent or more of the acreage.

The economic value of livestock produced that graze on BLM lands is estimated based on the market value of cattle and sheep. Values for cattle and sheep are estimated separately, and other grazing animals are considered of negligible commercial value. The direct value of production per AUM was estimated based on regional livestock production value data over 5 years and ratios in the livestock economics literature. **Table 3** shows the value of production per cow, AUMs per cow, and adjusted value of production per AUM. The value for cattle is $37.00 per AUM and the value for sheep is $59.56 per AUM.

The analysis focused on the economic impacts associated with cattle and sheep because those are the predominate types of livestock permitted to graze on BLM lands, however, BLM grazing permits may be issued for other classes of livestock. For the purposes of this analysis, one AUM for buffalo is assumed to be equivalent to one AUM for cattle and one AUM for goats is equivalent to one AUM for sheep. Forage utilization by horses was excluded from the analysis because it was assumed that most of this forage utilization for horses occurs as support for a ranching operation and would thus be an input cost for

Table 3. Value of Livestock

Year	Value of Livestock Production (Nominal $)[1,2]		AUMs per Animal[3]		Adjusted Value of Livestock Production per AUM (2021$)[4]	
	Cow	Sheep/Ewe	Cow	Sheep/Ewe	Cow	Sheep/Ewe
2015	1015.79	214	16	3.2	49.76	54.50
2016	704.62	202	16	3.2	41.41	60.96
2017	710.20	203	16	3.2	40.66	59.44
2018	589.29	204	16	3.2	35.00	61.47
2019	558.00	203	16	3.2	33.15	61.43
2020	565.77	—	16	—	35.66	—
2021	606.07	—	16	—	37.88	—
2022	698.80	—	16	—	43.30	—
5 Year Average	**603.59**	**205.20**	**16**	**3.2**	**37.00**	**59.56**

Source: [1]USDA Economic Research Service 2023; [2]USDA National Agricultural Statistics Service 2021; [3]The AUMs per animal is the number of months of forage one animal needs to grow to market weight, and was estimated from the estimated number of months to get an animal to market weight minus the estimated number of months the animal spends in a feedlot (Pennsylvania Beef Council 2024; US Agency for International Development; US Department of Agriculture 2013)
[4] Nominal values were converted to 2021 dollar values using IMPLAN deflators (IMPLAN 2021 Data).
— = Data not available

producing cattle and sheep. The IMPLAN sectors, 11, beef cattle ranching and farming, including feedlots and dual-purpose ranching and farming, and 14, animal production, except cattle and poultry and eggs were used to model an exogenous change in demand for livestock grazing on BLM lands for cattle and sheep, respectively.

The economic impacts were evaluated at both the analysis areas and state level for each state. The multi-regional input-output analysis feature of IMPLAN was used to evaluate the economic impacts at the state level from changes made in the analysis areas.

Forage utilization estimates in this analysis, and thus the economic impact estimates, only represent livestock grazing in sage-grouse habitat. They do not represent the total impact of livestock grazing in each state. Because of this, a percentage decrease between the action alternatives and Alternative 1 would be less on a total impact from livestock grazing basis than in the figures in **Chapter 4**, which are for livestock grazing in GRSG HMAs only.

18.4 SUPPLEMENTAL TABLES

Oil and Gas

Table 4. Average Annual Economic Contributions from Oil and Gas, Under Alternative I

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,574	6,574	790,898,405	790,898,405	3,979,134,548	3,979,134,548
	Indirect	7,090	9,671	473,848,226	776,442,707	1,408,076,009	2,011,832,079
	Induced	4,411	6,020	222,619,299	321,309,153	726,211,232	1,032,129,727
	Total	18,075	22,265	1,487,365,930	1,888,650,265	6,113,421,790	7,023,096,354
Colorado (High Scenario)	Direct	12,791	12,791	1,539,179,946	1,539,179,946	7,738,174,737	7,738,174,737
	Indirect	13,786	18,801	921,044,007	1,508,906,703	2,737,727,285	3,911,507,852
	Induced	8,581	11,708	433,092,289	624,894,000	1,412,797,333	2,007,343,698
	Total	35,158	43,301	2,893,316,242	3,672,980,648	11,888,699,355	13,657,026,287
Idaho	Direct	6	6	360,003	360,003	1,873,754	1,873,754
	Indirect	4	5	245,779	285,872	843,411	989,487
	Induced	2	2	99,312	113,394	327,260	373,549
	Total	13	14	705,095	759,269	3,044,425	3,236,789
Montana	Direct	1,922	1,922	284,762,972	284,762,972	1,318,085,631	1,318,085,631
	Indirect	1,563	1,725	105,741,719	118,169,771	327,422,634	359,077,656
	Induced	1,561	1,651	77,407,961	81,913,449	248,078,502	262,290,130
	Total	5,046	5,299	467,912,653	484,846,192	1,893,586,767	1,939,453,416
Nevada	Direct	18	18	249,165	249,165	6,374,761	6,374,761
	Indirect	17	18	1,554,685	1,580,942	4,001,386	4,162,182
	Induced	6	6	329,181	352,408	1,069,843	1,144,350
	Total	41	42	2,133,031	2,182,516	11,445,990	11,681,292
North Dakota	Direct	275	275	31,990,856	31,990,856	406,307,567	406,307,567
	Indirect	172	180	10,249,846	10,897,896	44,494,011	46,938,673
	Induced	105	119	4,331,162	5,067,030	15,914,717	18,161,000
	Total	551	573	46,571,864	47,955,782	466,716,295	471,407,239
South Dakota	Direct	91	91	7,240,119	7,240,119	35,371,675	35,371,675
	Indirect	123	137	6,133,793	7,168,460	22,819,308	26,579,293
	Induced	30	42	1,023,047	1,694,364	4,512,917	6,594,671
	Total	244	271	14,396,959	16,102,943	62,703,900	68,545,638
Utah	Direct	2,368	2,368	162,438,183	162,438,183	1,619,804,067	1,619,804,067
	Indirect	2,022	3,284	115,705,860	226,994,302	382,678,849	600,222,762
	Induced	814	1,407	31,513,987	64,193,883	122,797,623	230,483,019
	Total	5,204	7,059	309,658,031	453,626,368	2,125,280,538	2,450,509,848

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	16,564	16,564	1,764,447,162	1,764,447,162	11,626,402,461	11,626,402,461
	Indirect	12,284	12,337	776,372,794	780,303,077	2,672,749,560	2,684,939,890
	Induced	8,233	8,246	334,329,965	335,125,553	1,284,310,806	1,286,870,068
	Total	37,081	37,147	2,875,149,921	2,879,875,792	15,583,462,827	15,598,212,419
Total Planning Area (Low Colorado Scenario)	Direct	27,818	27,818	3,042,386,865	3,042,386,865	18,993,354,464	18,993,354,464
	Indirect	23,275	27,357	1,489,852,703	1,921,843,028	4,863,085,168	5,734,742,021
	Induced	15,161	17,494	671,653,916	809,769,234	2,403,222,900	2,838,046,512
	Total	66,255	72,669	5,203,893,485	5,773,999,127	26,259,662,533	27,566,142,997
Total Planning Area (High Colorado Scenario)	Direct	34,036	34,036	3,790,668,407	3,790,668,407	22,752,394,653	22,752,394,653
	Indirect	29,971	36,487	1,937,048,484	2,654,307,023	6,192,736,443	7,634,417,794
	Induced	19,331	23,183	882,126,906	1,113,354,081	3,089,809,001	3,813,260,483
	Total	83,338	93,706	6,609,843,797	7,558,329,511	32,034,940,098	34,200,072,929

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Table 5. Average Annual Economic Contributions from Oil and Gas, Under Alternative 2

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,669	6,669	802,283,755	802,283,755	4,036,412,178	4,036,412,178
	Indirect	7,192	9,810	480,668,731	787,619,135	1,428,344,184	2,040,792,766
	Induced	4,474	6,107	225,823,905	325,934,514	736,665,045	1,046,987,593
	Total	18,335	22,585	1,508,776,391	1,915,837,404	6,201,421,407	7,124,192,537
Colorado (High Scenario)	Direct	12,885	12,885	1,550,426,755	1,550,426,755	7,794,700,978	7,794,700,978
	Indirect	13,887	18,939	927,770,796	1,519,925,891	2,757,724,392	3,940,077,897
	Induced	8,644	11,794	436,256,457	629,458,854	1,423,119,210	2,022,007,419
	Total	35,415	43,617	2,914,454,009	3,699,811,501	11,975,544,580	13,756,786,294
Idaho	Direct	8	8	480,004	480,004	2,498,339	2,498,339
	Indirect	6	7	327,706	381,162	1,124,547	1,319,316
	Induced	3	3	132,416	151,192	436,347	498,065
	Total	17	18	940,127	1,012,359	4,059,233	4,315,719
Montana	Direct	1,922	1,922	284,762,972	284,762,972	1,318,085,631	1,318,085,631
	Indirect	1,563	1,725	105,741,719	118,169,771	327,422,634	359,077,656
	Induced	1,561	1,651	77,407,961	81,913,449	248,078,502	262,290,130
	Total	5,046	5,299	467,912,653	484,846,192	1,893,586,767	1,939,453,416
Nevada	Direct	18	18	249,165	249,165	6,374,761	6,374,761
	Indirect	17	18	1,554,685	1,580,942	4,001,386	4,162,182
	Induced	6	6	329,181	352,408	1,069,843	1,144,350
	Total	41	42	2,133,031	2,182,516	11,445,990	11,681,292
North Dakota	Direct	275	275	31,990,856	31,990,856	406,307,567	406,307,567
	Indirect	172	180	10,249,846	10,897,896	44,494,011	46,938,673
	Induced	105	119	4,331,162	5,067,030	15,914,717	18,161,000
	Total	551	573	46,571,864	47,955,782	466,716,295	471,407,239
South Dakota	Direct	91	91	7,240,119	7,240,119	35,371,675	35,371,675
	Indirect	123	137	6,133,793	7,168,460	22,819,308	26,579,293
	Induced	30	42	1,023,047	1,694,364	4,512,917	6,594,671
	Total	244	271	14,396,959	16,102,943	62,703,900	68,545,638
Utah	Direct	2,368	2,368	162,438,183	162,438,183	1,619,804,067	1,619,804,067
	Indirect	2,022	3,284	115,705,860	226,994,302	382,678,849	600,222,762
	Induced	814	1,407	31,513,987	64,193,883	122,797,623	230,483,019
	Total	5,204	7,059	309,658,031	453,626,368	2,125,280,538	2,450,509,848

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	16,564	16,564	1,764,447,162	1,764,447,162	11,626,402,461	11,626,402,461
	Indirect	12,284	12,337	776,372,794	780,303,077	2,672,749,560	2,684,939,890
	Induced	8,233	8,246	334,329,965	335,125,553	1,284,310,806	1,286,870,068
	Total	37,081	37,147	2,875,149,921	2,879,875,792	15,583,462,827	15,598,212,419
Total Planning Area (Low Colorado Scenario)	Direct	27,915	27,915	3,053,892,217	3,053,892,217	19,051,256,679	19,051,256,679
	Indirect	23,378	27,497	1,496,755,134	1,933,114,746	4,883,634,479	5,764,032,536
	Induced	15,225	17,582	674,891,626	814,432,393	2,413,785,800	2,853,028,895
	Total	66,519	72,994	5,225,538,978	5,801,439,357	26,348,676,958	27,668,318,110
Total Planning Area (High Colorado Scenario)	Direct	34,131	34,131	3,802,035,217	3,802,035,217	22,809,545,479	22,809,545,479
	Indirect	30,073	36,626	1,943,857,199	2,665,421,502	6,213,014,687	7,663,317,668
	Induced	19,395	23,269	885,324,179	1,117,956,733	3,100,239,965	3,828,048,720
	Total	83,599	94,027	6,631,216,595	7,585,413,453	32,122,800,131	34,300,911,866

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Table 6. Average Annual Economic Contributions from Oil and Gas, Under Alternative 3

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,263	6,263	755,042,456	755,042,456	3,769,457,803	3,769,457,803
	Indirect	6,710	9,103	446,597,038	726,374,125	1,331,090,703	1,889,268,560
	Induced	4,195	5,685	211,750,319	303,124,126	690,742,964	973,984,029
	Total	17,169	21,052	1,413,389,813	1,784,540,707	5,791,291,470	6,632,710,393
Colorado (High Scenario)	Direct	9,122	9,122	1,099,726,614	1,099,726,614	5,488,012,722	5,488,012,722
	Indirect	9,768	13,251	650,031,765	1,057,138,792	1,937,740,979	2,750,295,798
	Induced	6,109	8,278	308,357,016	441,345,785	1,005,879,186	1,418,118,570
	Total	24,999	30,651	2,058,115,395	2,598,211,191	8,431,632,887	9,656,427,089
Idaho	Direct	5	5	312,003	312,003	1,623,920	1,623,920
	Indirect	4	4	213,009	247,755	730,956	857,555
	Induced	2	2	86,071	98,275	283,626	323,742
	Total	11	12	611,082	658,033	2,638,502	2,805,218
Montana	Direct	1,373	1,373	208,532,284	208,532,284	981,019,294	981,019,294
	Indirect	1,148	1,289	78,451,760	89,461,172	240,701,264	266,572,096
	Induced	1,140	1,215	56,520,836	60,271,768	181,144,175	192,975,835
	Total	3,661	3,877	343,504,881	358,265,225	1,402,864,733	1,440,567,225
Nevada	Direct	5	5	75,848	75,848	1,872,389	1,872,389
	Indirect	5	5	455,757	463,564	1,176,678	1,224,327
	Induced	2	2	96,998	103,864	315,246	337,269
	Total	12	12	628,603	643,276	3,364,313	3,433,985
North Dakota	Direct	233	233	27,075,375	27,075,375	343,845,594	343,845,594
	Indirect	145	152	8,675,140	9,223,747	37,657,396	39,726,925
	Induced	89	100	3,665,718	4,288,558	13,469,565	15,370,822
	Total	467	485	39,416,233	40,587,679	394,972,555	398,943,340
South Dakota	Direct	87	87	6,922,320	6,922,320	33,656,596	33,656,596
	Indirect	117	130	5,837,008	6,805,826	21,664,800	25,189,292
	Induced	29	40	974,992	1,611,011	4,300,891	6,273,181
	Total	232	257	13,734,319	15,339,158	59,622,287	65,119,069
Utah	Direct	2,122	2,122	145,452,892	145,452,892	1,453,148,321	1,453,148,321
	Indirect	1,813	2,948	103,766,870	203,833,762	343,164,682	538,804,986
	Induced	729	1,262	28,240,142	57,623,630	110,040,697	206,863,910
	Total	4,664	6,332	277,459,904	406,910,285	1,906,353,700	2,198,817,217

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	6,963	6,963	708,184,660	708,184,660	5,901,184,407	5,901,184,407
	Indirect	5,228	5,244	356,127,143	357,292,356	1,177,946,394	1,181,560,469
	Induced	3,410	3,414	138,483,362	138,719,231	531,990,388	532,749,134
	Total	15,601	15,621	1,202,795,166	1,204,196,247	7,611,121,189	7,615,494,009
Total Planning Area (Low Colorado Scenario)	Direct	17,051	17,051	1,851,597,838	1,851,597,838	12,485,808,324	12,485,808,324
	Indirect	15,170	18,875	1,000,123,723	1,393,702,309	3,154,132,874	3,943,204,210
	Induced	9,596	11,722	439,818,440	565,840,463	1,532,287,551	1,928,877,922
	Total	41,817	47,648	3,291,540,001	3,811,140,610	17,172,228,749	18,357,890,456
Total Planning Area (High Colorado Scenario)	Direct	19,910	19,910	2,196,281,996	2,196,281,996	14,204,363,242	14,204,363,242
	Indirect	18,228	23,024	1,203,558,450	1,724,466,976	3,760,783,151	4,804,231,447
	Induced	11,510	14,314	536,425,136	704,062,122	1,847,423,773	2,373,012,463
	Total	49,648	57,247	3,936,265,583	4,624,811,095	19,812,570,166	21,381,607,153

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Table 7. Average Annual Economic Contributions from Oil and Gas, Under Alternative 4

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,948	6,948	835,579,681	835,579,681	4,210,876,842	4,210,876,842
	Indirect	7,504	10,248	501,986,077	823,906,926	1,490,742,665	2,133,156,312
	Induced	4,664	6,375	235,380,145	340,348,186	767,841,591	1,093,220,978
	Total	19,116	23,572	1,572,945,903	1,999,834,792	6,469,461,097	7,437,254,132
Colorado (High Scenario)	Direct	13,366	13,366	1,607,628,515	1,607,628,515	8,094,956,453	8,094,956,453
	Indirect	14,424	19,695	964,497,723	1,582,653,768	2,865,161,143	4,099,691,974
	Induced	8,969	12,257	452,687,909	654,332,656	1,476,725,857	2,101,783,237
	Total	36,759	45,318	3,024,814,147	3,844,614,938	12,436,843,453	14,296,431,664
Idaho	Direct	10	10	600,005	600,005	3,122,924	3,122,924
	Indirect	7	8	409,632	476,453	1,405,684	1,649,144
	Induced	3	4	165,521	188,990	545,434	622,581
	Total	21	23	1,175,158	1,265,448	5,074,042	5,394,649
Montana	Direct	1,922	1,922	284,762,972	284,762,972	1,318,085,631	1,318,085,631
	Indirect	1,563	1,725	105,741,719	118,169,771	327,422,634	359,077,656
	Induced	1,561	1,651	77,407,961	81,913,449	248,078,502	262,290,130
	Total	5,046	5,299	467,912,653	484,846,192	1,893,586,767	1,939,453,416
Nevada	Direct	18	18	249,165	249,165	6,374,761	6,374,761
	Indirect	17	18	1,554,685	1,580,942	4,001,386	4,162,182
	Induced	6	6	329,181	352,408	1,069,843	1,144,350
	Total	41	42	2,133,031	2,182,516	11,445,990	11,681,292
North Dakota	Direct	275	275	31,990,856	31,990,856	406,307,567	406,307,567
	Indirect	172	180	10,249,846	10,897,896	44,494,011	46,938,673
	Induced	105	119	4,331,162	5,067,030	15,914,717	18,161,000
	Total	551	573	46,571,864	47,955,782	466,716,295	471,407,239
South Dakota	Direct	91	91	7,240,119	7,240,119	35,371,675	35,371,675
	Indirect	123	137	6,133,793	7,168,460	22,819,308	26,579,293
	Induced	30	42	1,023,047	1,694,364	4,512,917	6,594,671
	Total	244	271	14,396,959	16,102,943	62,703,900	68,545,638
Utah	Direct	2,368	2,368	162,438,183	162,438,183	1,619,804,067	1,619,804,067
	Indirect	2,022	3,284	115,705,860	226,994,302	382,678,849	600,222,762
	Induced	814	1,407	31,513,987	64,193,883	122,797,623	230,483,019
	Total	5,204	7,059	309,658,031	453,626,368	2,125,280,538	2,450,509,848

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	11,557	11,557	1,213,568,369	1,213,568,369	8,640,549,791	8,640,549,791
	Indirect	8,604	8,638	557,201,554	559,689,736	1,893,160,674	1,900,878,122
	Induced	5,718	5,726	232,189,123	232,692,793	891,949,436	893,569,653
	Total	25,878	25,921	2,002,959,045	2,005,950,898	11,425,659,900	11,434,997,565
Total Planning Area (Low Colorado Scenario)	Direct	23,190	23,190	2,536,429,350	2,536,429,350	16,240,493,257	16,240,493,257
	Indirect	20,012	24,238	1,298,983,167	1,748,884,487	4,166,725,211	5,072,664,144
	Induced	12,900	15,331	582,340,128	726,451,103	2,052,710,063	2,506,086,381
	Total	56,102	62,759	4,417,752,645	5,011,764,940	22,459,928,530	23,819,243,781
Total Planning Area (High Colorado Scenario)	Direct	29,607	29,607	3,308,478,184	3,308,478,184	20,124,572,868	20,124,572,868
	Indirect	26,933	33,685	1,761,494,813	2,507,631,329	5,541,143,688	7,039,199,805
	Induced	17,206	21,213	799,647,892	1,040,435,573	2,761,594,329	3,514,648,639
	Total	73,746	84,505	5,869,620,890	6,856,545,085	28,427,310,886	30,678,421,313

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Table 8. Average Annual Economic Contributions from Oil and Gas, Under Alternative 5

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,948	6,948	835,579,681	835,579,681	4,210,876,842	4,210,876,842
	Indirect	7,504	10,248	501,986,077	823,906,926	1,490,742,665	2,133,156,312
	Induced	4,664	6,375	235,380,145	340,348,186	767,841,591	1,093,220,978
	Total	19,116	23,572	1,572,945,903	1,999,834,792	6,469,461,097	7,437,254,132
Colorado (High Scenario)	Direct	13,366	13,366	1,607,628,515	1,607,628,515	8,094,956,453	8,094,956,453
	Indirect	14,424	19,695	964,497,723	1,582,653,768	2,865,161,143	4,099,691,974
	Induced	8,969	12,257	452,687,909	654,332,656	1,476,725,857	2,101,783,237
	Total	36,759	45,318	3,024,814,147	3,844,614,938	12,436,843,453	14,296,431,664
Idaho	Direct	10	10	576,005	576,005	2,998,007	2,998,007
	Indirect	7	8	393,247	457,395	1,349,457	1,583,179
	Induced	3	4	158,900	181,431	523,616	597,678
	Total	20	22	1,128,152	1,214,830	4,871,080	5,178,863
Montana	Direct	1,922	1,922	284,762,972	284,762,972	1,318,085,631	1,318,085,631
	Indirect	1,563	1,725	105,741,719	118,169,771	327,422,634	359,077,656
	Induced	1,561	1,651	77,407,961	81,913,449	248,078,502	262,290,130
	Total	5,046	5,299	467,912,653	484,846,192	1,893,586,767	1,939,453,416
Nevada	Direct	18	18	249,165	249,165	6,374,761	6,374,761
	Indirect	17	18	1,554,685	1,580,942	4,001,386	4,162,182
	Induced	6	6	329,181	352,408	1,069,843	1,144,350
	Total	41	42	2,133,031	2,182,516	11,445,990	11,681,292
North Dakota	Direct	275	275	31,990,856	31,990,856	406,307,567	406,307,567
	Indirect	172	180	10,249,846	10,897,896	44,494,011	46,938,673
	Induced	105	119	4,331,162	5,067,030	15,914,717	18,161,000
	Total	551	573	46,571,864	47,955,782	466,716,295	471,407,239
South Dakota	Direct	91	91	7,240,119	7,240,119	35,371,675	35,371,675
	Indirect	123	137	6,133,793	7,168,460	22,819,308	26,579,293
	Induced	30	42	1,023,047	1,694,364	4,512,917	6,594,671
	Total	244	271	14,396,959	16,102,943	62,703,900	68,545,638
Utah	Direct	2,368	2,368	162,438,183	162,438,183	1,619,804,067	1,619,804,067
	Indirect	2,022	3,284	115,705,860	226,994,302	382,678,849	600,222,762
	Induced	814	1,407	31,513,987	64,193,883	122,797,623	230,483,019
	Total	5,204	7,059	309,658,031	453,626,368	2,125,280,538	2,450,509,848

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	15,728	15,728	1,672,490,384	1,672,490,384	11,127,941,682	11,127,941,682
	Indirect	11,670	11,719	739,785,658	743,475,229	2,542,611,380	2,554,055,105
	Induced	7,813	7,826	317,279,718	318,026,579	1,218,814,397	1,221,216,915
	Total	35,211	35,273	2,729,555,760	2,733,992,192	14,889,367,459	14,903,213,701
Total Planning Area (Low Colorado Scenario)	Direct	27,361	27,361	2,995,327,365	2,995,327,365	18,727,760,231	18,727,760,231
	Indirect	23,078	27,320	1,481,550,885	1,932,650,921	4,816,119,690	5,725,775,161
	Induced	14,995	17,430	667,424,103	811,777,330	2,379,553,206	2,833,708,740
	Total	65,434	72,110	5,144,302,354	5,739,755,616	25,923,433,127	27,287,244,131
Total Planning Area (High Colorado Scenario)	Direct	33,778	33,778	3,767,376,199	3,767,376,199	22,611,839,842	22,611,839,842
	Indirect	29,998	36,767	1,944,062,532	2,691,397,763	6,190,538,168	7,692,310,822
	Induced	19,301	23,312	884,731,867	1,125,761,799	3,088,437,472	3,842,270,998
	Total	83,077	93,857	6,596,170,598	7,584,535,762	31,890,815,482	34,146,421,663

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Table 9. Average Annual Economic Contributions from Oil and Gas, Under Alternative 6

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,948	6,948	835,579,681	835,579,681	4,210,876,842	4,210,876,842
	Indirect	7,504	10,248	501,986,077	823,906,926	1,490,742,665	2,133,156,312
	Induced	4,664	6,375	235,380,145	340,348,186	767,841,591	1,093,220,978
	Total	19,116	23,572	1,572,945,903	1,999,834,792	6,469,461,097	7,437,254,132
Colorado (High Scenario)	Direct	13,366	13,366	1,607,628,515	1,607,628,515	8,094,956,453	8,094,956,453
	Indirect	14,424	19,695	964,497,723	1,582,653,768	2,865,161,143	4,099,691,974
	Induced	8,969	12,257	452,687,909	654,332,656	1,476,725,857	2,101,783,237
	Total	36,759	45,318	3,024,814,147	3,844,614,938	12,436,843,453	14,296,431,664
Idaho	Direct	10	10	576,005	576,005	2,998,007	2,998,007
	Indirect	7	8	393,247	457,395	1,349,457	1,583,179
	Induced	3	4	158,900	181,431	523,616	597,678
	Total	20	22	1,128,152	1,214,830	4,871,080	5,178,863
Montana	Direct	1,922	1,922	284,762,972	284,762,972	1,318,085,631	1,318,085,631
	Indirect	1,563	1,725	105,741,719	118,169,771	327,422,634	359,077,656
	Induced	1,561	1,651	77,407,961	81,913,449	248,078,502	262,290,130
	Total	5,046	5,299	467,912,653	484,846,192	1,893,586,767	1,939,453,416
Nevada	Direct	18	18	249,165	249,165	6,374,761	6,374,761
	Indirect	17	18	1,554,685	1,580,942	4,001,386	4,162,182
	Induced	6	6	329,181	352,408	1,069,843	1,144,350
	Total	41	42	2,133,031	2,182,516	11,445,990	11,681,292
North Dakota	Direct	275	275	31,990,856	31,990,856	406,307,567	406,307,567
	Indirect	172	180	10,249,846	10,897,896	44,494,011	46,938,673
	Induced	105	119	4,331,162	5,067,030	15,914,717	18,161,000
	Total	551	573	46,571,864	47,955,782	466,716,295	471,407,239
South Dakota	Direct	91	91	7,240,119	7,240,119	35,371,675	35,371,675
	Indirect	123	137	6,133,793	7,168,460	22,819,308	26,579,293
	Induced	30	42	1,023,047	1,694,364	4,512,917	6,594,671
	Total	244	271	14,396,959	16,102,943	62,703,900	68,545,638
Utah	Direct	2,368	2,368	162,438,183	162,438,183	1,619,804,067	1,619,804,067
	Indirect	2,022	3,284	115,705,860	226,994,302	382,678,849	600,222,762
	Induced	814	1,407	31,513,987	64,193,883	122,797,623	230,483,019
	Total	5,204	7,059	309,658,031	453,626,368	2,125,280,538	2,450,509,848

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	15,560	15,560	1,654,005,799	1,654,005,799	11,027,827,872	11,027,827,872
	Indirect	11,546	11,595	732,434,155	736,075,311	2,516,458,936	2,527,752,496
	Induced	7,729	7,741	313,852,673	314,589,734	1,205,649,832	1,208,020,824
	Total	34,835	34,896	2,700,292,628	2,704,670,845	14,749,936,640	14,763,601,192
Total Planning Area (Low Colorado Scenario)	Direct	27,193	27,193	2,976,842,780	2,976,842,780	18,627,646,421	18,627,646,421
	Indirect	22,954	27,196	1,474,199,383	1,925,251,004	4,789,967,246	5,699,472,552
	Induced	14,911	17,346	663,997,059	808,340,485	2,366,388,641	2,820,512,649
	Total	65,058	71,734	5,115,039,221	5,710,434,268	25,784,002,308	27,147,631,622
Total Planning Area (High Colorado Scenario)	Direct	33,610	33,610	3,748,891,614	3,748,891,614	22,511,726,032	22,511,726,032
	Indirect	29,874	36,643	1,936,711,029	2,683,997,846	6,164,385,724	7,666,008,214
	Induced	19,217	23,228	881,304,823	1,122,324,955	3,075,272,907	3,829,074,907
	Total	82,701	93,480	6,566,907,466	7,555,214,414	31,751,384,663	34,006,809,153

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Geothermal

Table 10. Average Annual Economic Contributions from Geothermal, Under Alternative I

State	Type of Impact	Employment	Labor Income	Economic Output
California and Nevada Combined	Direct	276	17,088,024	24,364,445
	Indirect	191	14,858,872	70,756,086
	Induced	73	4,035,862	11,151,537
	Total	540	35,982,758	106,272,068
Colorado	Direct	8	536,971	761,363
	Indirect	4	333,762	1,356,788
	Induced	3	186,572	540,294
	Total	16	1,057,306	2,658,444
Idaho	Direct	22	1,020,547	1,413,689
	Indirect	10	561,620	2,833,188
	Induced	5	212,864	683,476
	Total	36	1,795,032	4,930,353
Oregon	Direct	6	297,479	402,124
	Indirect	3	188,906	846,182
	Induced	2	90,611	260,967
	Total	11	576,996	1,509,272
Utah	Direct	12	742,958	1,059,324
	Indirect	6	397,232	1,868,982
	Induced	4	209,788	671,228
	Total	22	1,349,977	3,599,534
Wyoming	Direct	6	288,314	388,376
	Indirect	2	113,518	796,725
	Induced	1	30,436	101,568
	Total	9	432,268	1,286,669
Total Planning Area	Direct	330	19,974,293	28,389,321
	Indirect	216	16,453,910	78,457,951
	Induced	88	4,766,133	13,409,070
	Total	634	41,194,337	120,256,340

Source: National Renewable Energy Laboratory 2016

Note: There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

Table 11. Average Annual Economic Contributions from Geothermal, Under Alternative 2

State	Type of Impact	Employment	Labor Income	Economic Output
California and Nevada Combined	Direct	276	17,088,024	24,364,445
	Indirect	191	14,858,872	70,756,086
	Induced	73	4,035,862	11,151,537
	Total	540	35,982,758	106,272,068
Colorado	Direct	8	536,971	761,363
	Indirect	4	333,762	1,356,788
	Induced	3	186,572	540,294
	Total	16	1,057,306	2,658,444
Idaho	Direct	22	1,020,547	1,413,689
	Indirect	10	561,620	2,833,188
	Induced	5	212,864	683,476
	Total	36	1,795,032	4,930,353
Oregon	Direct	6	297,479	402,124
	Indirect	3	188,906	846,182
	Induced	2	90,611	260,967
	Total	11	576,996	1,509,272
Utah	Direct	12	742,958	1,059,324
	Indirect	6	397,232	1,868,982
	Induced	4	209,788	671,228
	Total	22	1,349,977	3,599,534
Wyoming	Direct	6	288,314	388,376
	Indirect	2	113,518	796,725
	Induced	1	30,436	101,568
	Total	9	432,268	1,286,669
Total Planning Area	Direct	330	19,974,293	28,389,321
	Indirect	216	16,453,910	78,457,951
	Induced	88	4,766,133	13,409,070
	Total	634	41,194,337	120,256,340

Source: National Renewable Energy Laboratory 2016

Note: There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

Table 12. Average Annual Economic Contributions from Geothermal, Under Alternative 3

State	Type of Impact	Employment	Labor Income	Economic Output
California and Nevada Combined	Direct	276	17,088,024	24,364,445
	Indirect	191	14,858,872	70,756,086
	Induced	73	4,035,862	11,151,537
	Total	540	35,982,758	106,272,068
Colorado	Direct	0	0	0
	Indirect	0	0	0
	Induced	0	0	0
	Total	0	0	0
Idaho	Direct	11	514,407	711,614
	Indirect	5	281,427	1,421,504
	Induced	2	106,915	343,289
	Total	18	902,749	2,476,407
Oregon	Direct	0	0	0
	Indirect	0	0	0
	Induced	0	0	0
	Total	0	0	0
Utah	Direct	0	0	0
	Indirect	0	0	0
	Induced	0	0	0
	Total	0	0	0
Wyoming	Direct	0	0	0
	Indirect	0	0	0
	Induced	0	0	0
	Total	0	0	0
Total Planning Area	Direct	287	17,602,431	25,076,059
	Indirect	196	15,140,299	72,177,590
	Induced	75	4,142,777	11,494,826
	Total	558	36,885,507	108,748,475

Source: National Renewable Energy Laboratory 2016

Note: There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

Table 13. Average Annual Economic Contributions from Geothermal, Under Alternative 4

State	Type of Impact	Employment	Labor Income	Economic Output
California and Nevada Combined	Direct	276	17,088,024	24,364,445
	Indirect	191	14,858,872	70,756,086
	Induced	73	4,035,862	11,151,537
	Total	540	35,982,758	106,272,068
Colorado	Direct	8	536,971	761,363
	Indirect	4	333,762	1,356,788
	Induced	3	186,572	540,294
	Total	16	1,057,306	2,658,444
Idaho	Direct	22	1,020,547	1,413,689
	Indirect	10	561,620	2,833,188
	Induced	5	212,864	683,476
	Total	36	1,795,032	4,930,353
Oregon	Direct	6	297,479	402,124
	Indirect	3	188,906	846,182
	Induced	2	90,611	260,967
	Total	11	576,996	1,509,272
Utah	Direct	12	742,958	1,059,324
	Indirect	6	397,232	1,868,982
	Induced	4	209,788	671,228
	Total	22	1,349,977	3,599,534
Wyoming	Direct	6	288,314	388,376
	Indirect	2	113,518	796,725
	Induced	1	30,436	101,568
	Total	9	432,268	1,286,669
Total Planning Area	Direct	330	19,974,293	28,389,321
	Indirect	216	16,453,910	78,457,951
	Induced	88	4,766,133	13,409,070
	Total	634	41,194,337	120,256,340

Source: National Renewable Energy Laboratory 2016

Note: There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

Table 14. Average Annual Economic Contributions from Geothermal, Under Alternative 5

State	Type of Impact	Employment	Labor Income	Economic Output
California and Nevada Combined	Direct	276	17,088,024	24,364,445
	Indirect	191	14,858,872	70,756,086
	Induced	73	4,035,862	11,151,537
	Total	540	35,982,758	106,272,068
Colorado	Direct	8	536,971	761,363
	Indirect	4	333,762	1,356,788
	Induced	3	186,572	540,294
	Total	16	1,057,306	2,658,444
Idaho	Direct	22	1,020,547	1,413,689
	Indirect	10	561,620	2,833,188
	Induced	5	212,864	683,476
	Total	36	1,795,032	4,930,353
Oregon	Direct	6	297,479	402,124
	Indirect	3	188,906	846,182
	Induced	2	90,611	260,967
	Total	11	576,996	1,509,272
Utah	Direct	12	742,958	1,059,324
	Indirect	6	397,232	1,868,982
	Induced	4	209,788	671,228
	Total	22	1,349,977	3,599,534
Wyoming	Direct	6	288,314	388,376
	Indirect	2	113,518	796,725
	Induced	1	30,436	101,568
	Total	9	432,268	1,286,669
Total Planning Area	Direct	330	19,974,293	28,389,321
	Indirect	216	16,453,910	78,457,951
	Induced	88	4,766,133	13,409,070
	Total	634	41,194,337	120,256,340

Source: National Renewable Energy Laboratory 2016

Note: There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

Table 15. Average Annual Economic Contributions from Geothermal, Under Alternative 6

State	Type of Impact	Employment	Labor Income	Economic Output
California and Nevada Combined	Direct	276	17,088,024	24,364,445
	Indirect	191	14,858,872	70,756,086
	Induced	73	4,035,862	11,151,537
	Total	540	35,982,758	106,272,068
Colorado	Direct	8	536,971	761,363
	Indirect	4	333,762	1,356,788
	Induced	3	186,572	540,294
	Total	16	1,057,306	2,658,444
Idaho	Direct	22	1,020,547	1,413,689
	Indirect	10	561,620	2,833,188
	Induced	5	212,864	683,476
	Total	36	1,795,032	4,930,353
Oregon	Direct	6	297,479	402,124
	Indirect	3	188,906	846,182
	Induced	2	90,611	260,967
	Total	11	576,996	1,509,272
Utah	Direct	12	742,958	1,059,324
	Indirect	6	397,232	1,868,982
	Induced	4	209,788	671,228
	Total	22	1,349,977	3,599,534
Wyoming	Direct	6	288,314	388,376
	Indirect	2	113,518	796,725
	Induced	1	30,436	101,568
	Total	9	432,268	1,286,669
Total Planning Area	Direct	330	19,974,293	28,389,321
	Indirect	216	16,453,910	78,457,951
	Induced	88	4,766,133	13,409,070
	Total	634	41,194,337	120,256,340

Source: National Renewable Energy Laboratory 2016

Note: There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

Livestock Grazing

Table 16. Average Annual Economic Contributions from Livestock Grazing in Allotments where PHMA Accounted for 15 Percent or More of the Acreage, Under Alternative I

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
California	Direct	7	7	2,146,636	2,146,636	4,625,897	4,625,897
	Indirect	6	8	696,936	898,981	1,815,961	2,545,591
	Induced	6	7	261,689	340,831	995,028	1,219,542
	Total	19	22	3,105,261	3,386,449	7,436,887	8,391,031
Colorado	Direct	50	50	1,844,864	1,844,864	5,164,123	5,164,123
	Indirect	19	22	694,800	841,506	2,390,963	3,006,278
	Induced	9	10	455,946	514,078	1,491,065	1,671,211
	Total	78	82	2,995,610	3,200,447	9,046,152	9,841,613
Idaho	Direct	77	77	13,312,954	13,312,954	28,474,475	28,474,475
	Indirect	71	75	5,978,587	6,198,240	16,904,455	17,943,103
	Induced	66	68	3,158,689	3,294,103	10,417,492	10,862,683
	Total	214	221	22,450,229	22,805,297	55,796,422	57,280,261
Montana	Direct	186	186	10,506,213	10,506,213	33,185,106	33,185,106
	Indirect	109	122	6,251,713	6,858,824	20,744,631	22,504,995
	Induced	69	73	3,419,901	3,613,023	10,966,233	11,575,632
	Total	364	381	20,177,827	20,978,060	64,895,970	67,265,732
Nevada	Direct	82	82	13,703,178	13,703,178	42,086,589	42,086,589
	Indirect	85	88	5,973,781	6,146,434	20,950,722	22,479,206
	Induced	63	65	3,616,403	3,717,918	11,765,675	12,091,385
	Total	230	236	23,293,363	23,567,530	74,802,986	76,657,180
North Dakota	Direct	1	1	39,141	39,141	143,402	143,402
	Indirect	0	0	16,853	18,114	61,594	66,765
	Induced	0	0	6,328	6,822	23,344	24,852
	Total	1	1	62,321	64,077	228,340	235,019
Oregon	Direct	78	78	6,451,505	6,451,505	25,184,996	25,184,996
	Indirect	73	79	4,601,991	5,095,613	15,223,657	16,982,271
	Induced	46	49	2,412,991	2,592,299	7,323,332	7,844,739
	Total	197	206	13,466,487	14,139,416	47,731,985	50,012,006

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
South Dakota	Direct	5	5	185,898	185,898	1,405,882	1,405,882
	Indirect	4	4	157,013	176,985	794,297	888,717
	Induced	1	1	30,346	39,578	134,827	163,478
	Total	10	10	373,256	402,461	2,335,006	2,458,076
Utah	Direct	54	54	4,634,026	4,634,026	10,839,099	10,839,099
	Indirect	16	18	803,047	892,704	2,901,262	3,399,715
	Induced	17	18	646,897	692,011	2,527,803	2,676,460
	Total	87	90	6,083,969	6,218,740	16,268,163	16,915,273
Wyoming	Direct	301	301	14,742,131	14,742,131	52,633,690	52,633,690
	Indirect	172	176	7,079,345	7,304,934	26,109,990	27,047,064
	Induced	74	74	2,998,096	3,012,816	11,552,266	11,599,690
	Total	547	552	24,819,572	25,059,882	90,295,946	91,280,444
Total Planning Area	Direct	841	841	67,566,546	67,566,546	203,743,259	203,743,259
	Indirect	555	592	32,254,066	34,432,335	107,897,532	116,863,705
	Induced	351	365	17,007,286	17,823,479	57,197,065	59,729,672
	Total	1,747	1,801	116,827,895	119,822,359	368,837,857	380,336,635

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.

Table 17. Average Annual Economic Contributions from Livestock Grazing in Allotments where PHMA Accounted for 15 Percent or More of the Acreage, Under Alternative 2

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
California	Direct	7	7	2,146,636	2,146,636	4,625,897	4,625,897
	Indirect	6	8	696,936	898,981	1,815,961	2,545,591
	Induced	6	7	261,689	340,831	995,028	1,219,542
	Total	19	22	3,105,261	3,386,449	7,436,887	8,391,031
Colorado	Direct	50	50	1,844,864	1,844,864	5,164,123	5,164,123
	Indirect	19	22	694,800	841,506	2,390,963	3,006,278
	Induced	9	10	455,946	514,078	1,491,065	1,671,211
	Total	78	82	2,995,610	3,200,447	9,046,152	9,841,613
Idaho	Direct	77	77	13,312,954	13,312,954	28,474,475	28,474,475
	Indirect	71	75	5,978,587	6,198,240	16,904,455	17,943,103
	Induced	66	68	3,158,689	3,294,103	10,417,492	10,862,683
	Total	214	221	22,450,229	22,805,297	55,796,422	57,280,261
Montana	Direct	186	186	10,506,213	10,506,213	33,185,106	33,185,106
	Indirect	109	122	6,251,713	6,858,824	20,744,631	22,504,995
	Induced	69	73	3,419,901	3,613,023	10,966,233	11,575,632
	Total	364	381	20,177,827	20,978,060	64,895,970	67,265,732
Nevada	Direct	82	82	13,703,178	13,703,178	42,086,589	42,086,589
	Indirect	85	88	5,973,781	6,146,434	20,950,722	22,479,206
	Induced	63	65	3,616,403	3,717,918	11,765,675	12,091,385
	Total	230	236	23,293,363	23,567,530	74,802,986	76,657,180
North Dakota	Direct	1	1	39,141	39,141	143,402	143,402
	Indirect	0	0	16,853	18,114	61,594	66,765
	Induced	0	0	6,328	6,822	23,344	24,852
	Total	1	1	62,321	64,077	228,340	235,019
Oregon	Direct	78	78	6,451,505	6,451,505	25,184,996	25,184,996
	Indirect	73	79	4,601,991	5,095,613	15,223,657	16,982,271
	Induced	46	49	2,412,991	2,592,299	7,323,332	7,844,739
	Total	197	206	13,466,487	14,139,416	47,731,985	50,012,006
South Dakota	Direct	5	5	185,898	185,898	1,405,882	1,405,882
	Indirect	4	4	157,013	176,985	794,297	888,717
	Induced	1	1	30,346	39,578	134,827	163,478
	Total	10	10	373,256	402,461	2,335,006	2,458,076

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Utah	Direct	54	54	4,634,026	4,634,026	10,839,099	10,839,099
	Indirect	16	18	803,047	892,704	2,901,262	3,399,715
	Induced	17	18	646,897	692,011	2,527,803	2,676,460
	Total	87	90	6,083,969	6,218,740	16,268,163	16,915,273
Wyoming	Direct	301	301	14,742,131	14,742,131	52,633,690	52,633,690
	Indirect	172	176	7,079,345	7,304,934	26,109,990	27,047,064
	Induced	74	74	2,998,096	3,012,816	11,552,266	11,599,690
	Total	547	552	24,819,572	25,059,882	90,295,946	91,280,444
Total Planning Area	Direct	841	841	67,566,546	67,566,546	203,743,259	203,743,259
	Indirect	555	592	32,254,066	34,432,335	107,897,532	116,863,705
	Induced	351	365	17,007,286	17,823,479	57,197,065	59,729,672
	Total	1,747	1,801	116,827,895	119,822,359	368,837,857	380,336,635

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.

Table 18. Average Annual Economic Contributions from Livestock Grazing in Allotments where PHMA Accounted for 15 Percent or More of the Acreage, Under Alternative 3

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
California	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Colorado	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Idaho	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Montana	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Nevada	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
North Dakota	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Oregon	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
South Dakota	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Utah	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Wyoming	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Total Planning Area	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.

Table 19. Average Annual Economic Contributions from Livestock Grazing in Allotments where PHMA Accounted for 15 Percent or More of the Acreage, Under Alternative 4

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
California	Direct	7	7	2,146,636	2,146,636	4,625,897	4,625,897
	Indirect	6	8	696,936	898,981	1,815,961	2,545,591
	Induced	6	7	261,689	340,831	995,028	1,219,542
	Total	19	22	3,105,261	3,386,449	7,436,887	8,391,031
Colorado	Direct	50	50	1,844,864	1,844,864	5,164,123	5,164,123
	Indirect	19	22	694,800	841,506	2,390,963	3,006,278
	Induced	9	10	455,946	514,078	1,491,065	1,671,211
	Total	78	82	2,995,610	3,200,447	9,046,152	9,841,613
Idaho	Direct	77	77	13,312,954	13,312,954	28,474,475	28,474,475
	Indirect	71	75	5,978,587	6,198,240	16,904,455	17,943,103
	Induced	66	68	3,158,689	3,294,103	10,417,492	10,862,683
	Total	214	221	22,450,229	22,805,297	55,796,422	57,280,261
Montana	Direct	186	186	10,506,213	10,506,213	33,185,106	33,185,106
	Indirect	109	122	6,251,713	6,858,824	20,744,631	22,504,995
	Induced	69	73	3,419,901	3,613,023	10,966,233	11,575,632
	Total	364	381	20,177,827	20,978,060	64,895,970	67,265,732
Nevada	Direct	82	82	13,703,178	13,703,178	42,086,589	42,086,589
	Indirect	85	88	5,973,781	6,146,434	20,950,722	22,479,206
	Induced	63	65	3,616,403	3,717,918	11,765,675	12,091,385
	Total	230	236	23,293,363	23,567,530	74,802,986	76,657,180
North Dakota	Direct	1	1	39,141	39,141	143,402	143,402
	Indirect	0	0	16,853	18,114	61,594	66,765
	Induced	0	0	6,328	6,822	23,344	24,852
	Total	1	1	62,321	64,077	228,340	235,019
Oregon	Direct	78	78	6,451,505	6,451,505	25,184,996	25,184,996
	Indirect	73	79	4,601,991	5,095,613	15,223,657	16,982,271
	Induced	46	49	2,412,991	2,592,299	7,323,332	7,844,739
	Total	197	206	13,466,487	14,139,416	47,731,985	50,012,006
South Dakota	Direct	5	5	185,898	185,898	1,405,882	1,405,882
	Indirect	4	4	157,013	176,985	794,297	888,717
	Induced	1	1	30,346	39,578	134,827	163,478
	Total	10	10	373,256	402,461	2,335,006	2,458,076

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Utah	Direct	54	54	4,634,026	4,634,026	10,839,099	10,839,099
	Indirect	16	18	803,047	892,704	2,901,262	3,399,715
	Induced	17	18	646,897	692,011	2,527,803	2,676,460
	Total	87	90	6,083,969	6,218,740	16,268,163	16,915,273
Wyoming	Direct	301	301	14,742,131	14,742,131	52,633,690	52,633,690
	Indirect	172	176	7,079,345	7,304,934	26,109,990	27,047,064
	Induced	74	74	2,998,096	3,012,816	11,552,266	11,599,690
	Total	547	552	24,819,572	25,059,882	90,295,946	91,280,444
Total Planning Area	Direct	841	841	67,566,546	67,566,546	203,743,259	203,743,259
	Indirect	555	592	32,254,066	34,432,335	107,897,532	116,863,705
	Induced	351	365	17,007,286	17,823,479	57,197,065	59,729,672
	Total	1,747	1,801	116,827,895	119,822,359	368,837,857	380,336,635

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.

Table 20. Average Annual Economic Contributions from Livestock Grazing in Allotments where PHMA Accounted for 15 Percent or More of the Acreage, Under Alternative 5

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
California	Direct	7	7	2,146,636	2,146,636	4,625,897	4,625,897
	Indirect	6	8	696,936	898,981	1,815,961	2,545,591
	Induced	6	7	261,689	340,831	995,028	1,219,542
	Total	19	22	3,105,261	3,386,449	7,436,887	8,391,031
Colorado	Direct	50	50	1,844,864	1,844,864	5,164,123	5,164,123
	Indirect	19	22	694,800	841,506	2,390,963	3,006,278
	Induced	9	10	455,946	514,078	1,491,065	1,671,211
	Total	78	82	2,995,610	3,200,447	9,046,152	9,841,613
Idaho	Direct	77	77	13,312,954	13,312,954	28,474,475	28,474,475
	Indirect	71	75	5,978,587	6,198,240	16,904,455	17,943,103
	Induced	66	68	3,158,689	3,294,103	10,417,492	10,862,683
	Total	214	221	22,450,229	22,805,297	55,796,422	57,280,261
Montana	Direct	186	186	10,506,213	10,506,213	33,185,106	33,185,106
	Indirect	109	122	6,251,713	6,858,824	20,744,631	22,504,995
	Induced	69	73	3,419,901	3,613,023	10,966,233	11,575,632
	Total	364	381	20,177,827	20,978,060	64,895,970	67,265,732
Nevada	Direct	82	82	13,703,178	13,703,178	42,086,589	42,086,589
	Indirect	85	88	5,973,781	6,146,434	20,950,722	22,479,206
	Induced	63	65	3,616,403	3,717,918	11,765,675	12,091,385
	Total	230	236	23,293,363	23,567,530	74,802,986	76,657,180
North Dakota	Direct	1	1	39,141	39,141	143,402	143,402
	Indirect	0	0	16,853	18,114	61,594	66,765
	Induced	0	0	6,328	6,822	23,344	24,852
	Total	1	1	62,321	64,077	228,340	235,019
Oregon	Direct	78	78	6,451,505	6,451,505	25,184,996	25,184,996
	Indirect	73	79	4,601,991	5,095,613	15,223,657	16,982,271
	Induced	46	49	2,412,991	2,592,299	7,323,332	7,844,739
	Total	197	206	13,466,487	14,139,416	47,731,985	50,012,006
South Dakota	Direct	5	5	185,898	185,898	1,405,882	1,405,882
	Indirect	4	4	157,013	176,985	794,297	888,717
	Induced	1	1	30,346	39,578	134,827	163,478
	Total	10	10	373,256	402,461	2,335,006	2,458,076

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Utah	Direct	54	54	4,634,026	4,634,026	10,839,099	10,839,099
	Indirect	16	18	803,047	892,704	2,901,262	3,399,715
	Induced	17	18	646,897	692,011	2,527,803	2,676,460
	Total	87	90	6,083,969	6,218,740	16,268,163	16,915,273
Wyoming	Direct	301	301	14,742,131	14,742,131	52,633,690	52,633,690
	Indirect	172	176	7,079,345	7,304,934	26,109,990	27,047,064
	Induced	74	74	2,998,096	3,012,816	11,552,266	11,599,690
	Total	547	552	24,819,572	25,059,882	90,295,946	91,280,444
Total Planning Area	Direct	841	841	67,566,546	67,566,546	203,743,259	203,743,259
	Indirect	555	592	32,254,066	34,432,335	107,897,532	116,863,705
	Induced	351	365	17,007,286	17,823,479	57,197,065	59,729,672
	Total	1,747	1,801	116,827,895	119,822,359	368,837,857	380,336,635

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.

Table 21. Average Annual Economic Contributions from Livestock Grazing in Allotments where PHMA Accounted for 15 Percent or More of the Acreage, Under Alternative 6

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
California	Direct	7	7	2,146,636	2,146,636	4,625,897	4,625,897
	Indirect	6	8	696,936	898,981	1,815,961	2,545,591
	Induced	6	7	261,689	340,831	995,028	1,219,542
	Total	19	22	3,105,261	3,386,449	7,436,887	8,391,031
Colorado	Direct	50	50	1,844,864	1,844,864	5,164,123	5,164,123
	Indirect	19	22	694,800	841,506	2,390,963	3,006,278
	Induced	9	10	455,946	514,078	1,491,065	1,671,211
	Total	78	82	2,995,610	3,200,447	9,046,152	9,841,613
Idaho	Direct	77	77	13,312,954	13,312,954	28,474,475	28,474,475
	Indirect	71	75	5,978,587	6,198,240	16,904,455	17,943,103
	Induced	66	68	3,158,689	3,294,103	10,417,492	10,862,683
	Total	214	221	22,450,229	22,805,297	55,796,422	57,280,261
Montana	Direct	186	186	10,506,213	10,506,213	33,185,106	33,185,106
	Indirect	109	122	6,251,713	6,858,824	20,744,631	22,504,995
	Induced	69	73	3,419,901	3,613,023	10,966,233	11,575,632
	Total	364	381	20,177,827	20,978,060	64,895,970	67,265,732
Nevada	Direct	82	82	13,703,178	13,703,178	42,086,589	42,086,589
	Indirect	85	88	5,973,781	6,146,434	20,950,722	22,479,206
	Induced	63	65	3,616,403	3,717,918	11,765,675	12,091,385
	Total	230	236	23,293,363	23,567,530	74,802,986	76,657,180
North Dakota	Direct	1	1	39,141	39,141	143,402	143,402
	Indirect	0	0	16,853	18,114	61,594	66,765
	Induced	0	0	6,328	6,822	23,344	24,852
	Total	1	1	62,321	64,077	228,340	235,019
Oregon	Direct	78	78	6,451,505	6,451,505	25,184,996	25,184,996
	Indirect	73	79	4,601,991	5,095,613	15,223,657	16,982,271
	Induced	46	49	2,412,991	2,592,299	7,323,332	7,844,739
	Total	197	206	13,466,487	14,139,416	47,731,985	50,012,006
South Dakota	Direct	5	5	185,898	185,898	1,405,882	1,405,882
	Indirect	4	4	157,013	176,985	794,297	888,717
	Induced	1	1	30,346	39,578	134,827	163,478
	Total	10	10	373,256	402,461	2,335,006	2,458,076

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Utah	Direct	54	54	4,634,026	4,634,026	10,839,099	10,839,099
	Indirect	16	18	803,047	892,704	2,901,262	3,399,715
	Induced	17	18	646,897	692,011	2,527,803	2,676,460
	Total	87	90	6,083,969	6,218,740	16,268,163	16,915,273
Wyoming	Direct	301	301	14,742,131	14,742,131	52,633,690	52,633,690
	Indirect	172	176	7,079,345	7,304,934	26,109,990	27,047,064
	Induced	74	74	2,998,096	3,012,816	11,552,266	11,599,690
	Total	547	552	24,819,572	25,059,882	90,295,946	91,280,444
Total Planning Area	Direct	841	841	67,566,546	67,566,546	203,743,259	203,743,259
	Indirect	555	592	32,254,066	34,432,335	107,897,532	116,863,705
	Induced	351	365	17,007,286	17,823,479	57,197,065	59,729,672
	Total	1,747	1,801	116,827,895	119,822,359	368,837,857	380,336,635

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.

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