Appendix L. Economic Impact Analysis Methodology

L.1. Introduction

This appendix describes the methods and data that underlie the economic impact modeling analysis. Input-output models such as the Impact Analysis for Planning (IMPLAN) model, an economic impact analysis model, provide a quantitative representation of the production relationships between individual economic sectors. Thus, the economic modeling analysis uses information about physical production quantities and the prices and costs for goods and services. The inputs required to run the IMPLAN model are described in the following narrative and tables. The resulting estimates from the IMPLAN model, by alternative, can be found in the Economic Conditions section in Chapter 4. The first section of this appendix describes general aspects of the IMPLAN model and how it was used to estimate economic impacts. The remaining sections provide additional detailed data used in the analysis for oil and gas, livestock grazing, and recreation.

L.2. The IMPLAN Model

IMPLAN is a regional economic model that provides a mathematical accounting of the flow of money, goods, and services through a region's economy. The model provides estimates of how a specific economic activity translates into jobs and income for the region. It includes the ripple effect (also called the "multiplier effect") of changes in economic sectors that may not be directly impacted by management actions, but are linked to industries that are directly impacted. In IMPLAN, these ripple effects are termed indirect impacts (for changes in industries that sell inputs to the industries that are directly impacted) and induced impacts (for changes in household spending as household income increases or decreases due to the changes in production).

This analysis used IMPLAN 2007; prior to running the model, cost and price data were converted to a consistent dollar year (2007) using regional and sector-specific adjustment factors from the IMPLAN model. The values in this appendix are expressed in year 2007 dollars so that the earnings and employment estimates can be easily compared to the latest (i.e., 2007) earnings and employment data available from the Bureau of Economic Analysis.

The current IMPLAN model has 440 economic sectors, of which 221 are represented in the five planning area counties. This analysis involved direct changes in economic activity for 33 IMPLAN economic sectors, as well as changes in all other related sectors due to the ripple effect. The IMPLAN production coefficients were modified to reflect the interaction of producing sectors in the study area. As a result, the calibrated model does a better job of generating multipliers and the subsequent impacts that reflect the interaction between and among the sectors in the study area compared to a model using unadjusted national coefficients. For instance, worker productivity in oil and gas production is higher in Wyoming than the national average. Key variables used in the IMPLAN model were filled in using data specific to Wyoming, including employment estimates, labor earnings, and total industry output. The IMPLAN model is run at a regional (multi-county) scale, with the coefficients that describe linkages between sectors aggregated to the five-county level. Because of this mathematical aggregation, it is not possible to identify total economic impacts for an individual community.

L.3. Oil and Gas

The economic impacts analysis for oil and gas reflects drilling, completion, and production activities. The number of wells drilled and completed is based on the Reasonable Foreseeable Development scenario (BLM 2009c) and the constraints applied under each alternative. Total well numbers for each alternative are presented in Table L.1, "Oil and Gas Well Numbers" (p. 1584). Table L.2, "Projected Oil and Gas Production (Federal Surface)" (p. 1585) presents the quantity of oil and gas produced on federal surface, and Table L.3, "Projected Oil and Gas Production (Federal, State, and Fee Surface)" (p. 1586) presents the projected quantity of oil and gas produced from federal, state, and private (fee) surface.

Table L.1. Oil and Gas Well Numbers

Item	Non-Coalbed Exploratory	Non-Coalbed Development	Coalbed Natural Gas	Deep	Total
Federal Surface					
Alternative A – Wells Drilled	237	1,511	480	46	2,274
Alternative A – Wells Completed	142	1,209	432	37	1,820
Alternative B – Wells Drilled	189	1,209	93	37	1,528
Alternative B – Wells Completed	113	967	84	30	1,194
Alternative C – Wells Drilled	237	1,516	484	47	2,284
Alternative C – Wells Completed	142	1,213	436	38	1,828
Alternative D – Wells Drilled	227	1,447	406	45	2,125
Alternative D – Wells Completed	136	1,158	365	36	1,695
Federal, State, and Fee Surface					
Alternative A – Wells Drilled	331	2,107	823	73	3,334
Alternative A – Wells Completed	199	1,686	741	58	2,683
Alternative B – Wells Drilled	283	1,806	436	63	2,588
Alternative B – Wells Completed	170	1,445	392	50	2,057
Alternative C – Wells Drilled	331	2,112	827	74	3,344
Alternative C – Wells Completed	199	1,690	744	59	2,692
Alternative D – Wells Drilled	321	2,044	749	71	3,185
Alternative D – Wells Completed	193	1,635	674	57	2,559
Source: BLM 2009c					

Table L.2. Projected Oil and Gas Production (Federal Surface)

Year	Alternative A		Alternative B		Alternative C		Alternative D	
	Gas (BCF)	Oil (MMBO)	Gas (BCF)	Oil (MMBO)	Gas (BCF)	Oil (MMBO)	Gas (BCF)	Oil (MMBO)
2008	131.9	2.2	99.4	1.7	132.5	2.2	123.0	2.1
2009	147.7	2.2	111.4	1.7	148.3	2.2	137.8	2.1
2010	153.4	2.3	115.7	1.7	154.1	2.3	143.2	2.1
2011	154.5	2.3	116.5	1.7	155.2	2.3	144.1	2.1
2012	165.2	2.3	124.6	1.7	165.9	2.3	154.1	2.2
2013	180.7	2.3	136.3	1.8	181.5	2.3	168.6	2.2
2014	183.6	2.5	138.4	1.9	184.4	2.5	171.3	2.4
2015	195.9	2.4	147.7	1.8	196.7	2.4	182.8	2.2
2016	218.2	2.5	164.5	1.9	219.1	2.5	203.5	2.3
2017	213.0	2.4	160.6	1.8	214.0	2.4	198.8	2.2
2018	220.7	2.2	166.4	1.6	221.7	2.2	205.9	2.0
2019	244.0	2.4	184.0	1.8	245.1	2.5	227.6	2.3
2020	255.3	2.5	192.5	1.9	256.4	2.6	238.2	2.4
2021	270.5	2.7	204.0	2.0	271.8	2.7	252.4	2.5
2022	274.7	2.6	207.2	1.9	275.9	2.6	256.3	2.4
2023	280.8	2.8	211.8	2.1	282.1	2.8	262.0	2.6
2024	299.7	2.7	226.0	2.0	301.0	2.7	279.6	2.5
2025	305.8	2.7	230.6	2.1	307.2	2.7	285.4	2.5
2026	317.0	2.7	239.1	2.1	318.4	2.8	295.8	2.6
2027	318.4	2.9	240.1	2.2	319.9	2.9	297.1	2.7

Source: BLM 2009c. Estimated from production on federal, state, and fee surface, multiplied by the percentage of federal wells.

BCF billion cubic feet
MMBO million barrels of oil

Table L.3. Projected Oil and Gas Production (Federal, State, and Fee Surface)

Year	Alternative A		Alternative B		Alternative C		Alternative D	
	Gas (BCF)	Oil (MMBO)	Gas (BCF)	Oil (MMBO)	Gas (BCF)	Oil (MMBO)	Gas (BCF)	Oil (MMBO)
2008	194.4	3.3	162.6	2.7	195.0	3.3	185.7	3.1
2009	217.7	3.3	182.1	2.8	218.4	3.3	208.0	3.1
2010	226.3	3.3	189.2	2.8	226.9	3.4	216.1	3.2
2011	227.8	3.4	190.5	2.8	228.4	3.4	217.6	3.2
2012	243.6	3.4	203.7	2.8	244.3	3.4	232.7	3.2
2013	266.4	3.4	222.8	2.9	267.2	3.4	254.5	3.3
2014	270.7	3.7	226.3	3.1	271.5	3.7	258.6	3.6
2015	288.8	3.5	241.5	2.9	289.7	3.5	275.9	3.4
2016	321.7	3.6	269.0	3.0	322.6	3.7	307.3	3.5
2017	314.1	3.5	262.7	2.9	315.0	3.5	300.1	3.3
2018	325.4	3.2	272.1	2.7	326.4	3.2	310.9	3.1
2019	359.7	3.6	300.8	3.0	360.8	3.6	343.7	3.4
2020	376.4	3.8	314.7	3.1	377.5	3.8	359.6	3.6
2021	398.9	3.9	333.6	3.3	400.1	3.9	381.1	3.7
2022	405.0	3.8	338.7	3.2	406.3	3.8	386.9	3.6
2023	414.0	4.1	346.2	3.4	415.3	4.1	395.5	3.9
2024	441.9	3.9	369.5	3.3	443.2	3.9	422.1	3.8
2025	451.0	4.0	377.1	3.4	452.3	4.0	430.8	3.8
2026	467.4	4.0	390.9	3.4	468.9	4.1	446.6	3.9
2027	469.5	4.3	392.6	3.6	470.9	4.3	448.5	4.1

Source: BLM 2009c

BCF billion cubic feet
MMBO million barrels of oil

The costs of drilling and completing wells and producing oil and gas are also relevant for the economic impact analysis, because a portion of these costs represents spending on local services and locally produced products. Table L.4, "Assumptions for Analysis of Economic Impacts for Oil and Gas Well Drilling and Completion According to Well Type" (p. 1587) provides a summary of the costs of drilling, completion, and production for each well type (non-coalbed development, non-coalbed exploratory, coalbed natural gas, and deep) used for the economic analysis.

Table L.4. Assumptions for Analysis of Economic Impacts for Oil and Gas Well Drilling and Completion According to Well Type

Assumption	Well Type			
	Non-Coalbed Exploratory	Non-Coalbed Development	Coalbed Natural Gas	Deep
Well Drilling Impacts				
Drilling Cost ($/well)	$1,292,076	$1,174,615	$434,648	$5,603,020
Local Drilling Costs[1]	75%	75%	75%	75%
Local Direct Impact ($/well)	$969,057	$880,961	$325,986	$4,202,265
Local Total Impact ($/well)[2]	$1,350,770	$1,227,973	$445,006	$5,825,255
Multiplier (total impact/direct impact)	1.39	1.39	1.37	1.39
Well Completion Impacts				
Completion Cost ($/well)	$1,396,749	$1,269,772	$892,071	$2,580,899
Local Completion Costs[1]	75%	75%	75%	75%
Local Direct Impact ($/well)	$1,047,562	$952,329	$669,053	$1,935,674
Local Total Impact ($/well)[2]	$1,470,533	$1,336,848	$836,215	$2,530,834
Multiplier (total impact/direct impact)	1.40	1.40	1.25	1.31

Source: BLM 2010i. Data are based on Authorizations For Expenditure provided by exploration and development companies, converted from 2009 to 2007 dollars using adjustment factors (that differ by economic sector) from the IMPLAN 2007 model.
[1] The local cost shares were based on the percent of total drilling or completion costs that would be spent on goods and services purchased from the local economy. Most services come from Rock Springs, Riverton, Rawlins and Casper. All of these communities are located within the planning area identified counties. However, a portion of the value comes from outside the planning area, even for supplies purchased locally, because the raw material and embedded labor comes from outside the planning area.
[2] Total impacts estimated using IMPLAN include direct, indirect, and induced impacts.

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Table L.5, "Assumptions for Analysis of Economical Impacts on Output for Oil and Gas Production" (p. 1588) provides the assumptions used to determine the economic impact associated with the production of oil and gas. For the analysis, Bureau of Land Management (BLM) estimated a production cost (for gas) of $1.43 per thousand cubic feet (mcf), in year 2007 dollars, based on data from the Energy Information Administration (Taylor 2010).

Table L.5. Assumptions for Analysis of Economical Impacts on Output for Oil and Gas Production

Economic Impact	Oil Production (per million barrels)	Gas Production (per billion cubic feet)
Direct Economic Impact[1]	$63,300,000[2]	$4,010,000[3]
Indirect Economic Impact[4]	$9,942,658	$629,859
Induced Economic Impact[5]	$2,678,476	$169,679
Total Economic Impact	$75,921,134	$4,809,538
Multiplier (total impact/direct impact)	1.20	1.20

Note: All dollar values are in 2007 dollars.
[1]Direct economic impact is the market value of output.
[2]Based on an oil price of $63.30 per barrel, which is an average of the prices for 2009-2014 projected by the Wyoming Consensus Revenue Estimating Group (CREG 2009b) and adjusted to 2007 dollars.
[3]Based on a gas price of $4.01 per mcf, which is an average of the prices for 2009-2014 projected by the Wyoming Consensus Revenue Estimating Group (CREG 2009b) and adjusted to 2007 dollars.
[4]Indirect impacts from IMPLAN reflect increased demand in sectors that directly or indirectly provide supplies to the oil and gas industry.
[5]Induced impacts from IMPLAN reflect increased demand in the consumer and government sectors.

mcf thousand cubic feet
IMPLAN Impact Analysis for Planning

The forecasted number of wells and production used for estimating employment impacts is the same as for estimating impacts on labor earnings and output. Table L.6, "Assumptions for Employment Impact Analysis for Oil and Gas Well Drilling and Completion According to Well Type" (p. 1588) shows the direct and total employment impacts attributable to drilling and completion.

Table L.6. Assumptions for Employment Impact Analysis for Oil and Gas Well Drilling and Completion According to Well Type

Employment Impact	Well Type			
	Non-Coalbed Exploratory	Non-Coalbed Development	Coalbed Natural Gas	Deep
Well Drilling Impacts				
Direct Employment (jobs/well)	4.40	4.00	1.50	19.80
Total Employment Impact (jobs/well)	7.59	6.90	2.50	32.80
Multiplier (Total Impact/Direct Impact)	1.73	1.73	1.67	1.66
Average Earnings per Job (2007 dollars)	$57,776	$57,776	$56,203	$59,044
Well Completion Impacts				
Direct Employment (jobs/well)	5.28	4.80	2.10	7.50
Total Employment Impact (jobs/well)	8.80	8.00	3.50	12.50
Multiplier (Total Impact/Direct Impact)	1.67	1.67	1.67	1.67
Average Earnings per Job (2007 dollars)	$58,859	$58,859	$58,835	$59,315

Note: Direct and total employment impact and average earnings per job are calculated using IMPLAN.

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Table L.7, "Assumptions for Employment Impacts Analysis for Oil and Gas Production" (p. 1589) shows the direct and total employment impacts associated with production.

Table L.7. Assumptions for Employment Impacts Analysis for Oil and Gas Production

Employment Impact (annual number of jobs)	Oil Production (per million barrels)	Gas Production (per billion cubic feet)
Direct Employment	31.7	2.0
Indirect Employment	57.0	3.6
Induced Employment	25.3	1.6
Total Employment	113.9	7.2
Multiplier (Total Impact/Direct Impact)	3.60	3.60
Average Earnings per Job (2007 dollars)	$55,267	$55,267
Note: Direct, indirect, and induced employment impact and average earnings per job are calculated using IMPLAN. IMPLAN Impact Analysis for Planning		

The analysis of potential changes in tax revenues is based on tax rates of 12.5 percent of taxable value for federal mineral royalties, 6 percent of taxable value for state severance taxes (Wyoming DOR 2001c), and 7.1 percent of taxable value for local ad valorem production taxes. The average estimated local tax rate is based on average tax rates for the planning area counties: Carbon (6.5 percent), Fremont (7.2 percent), Hot Springs (7.1 percent), Natrona (6.6 percent), and Sweetwater (6.6 percent) (Wyoming DOR 2008). Taxable value refers to value of sales minus allowable deductions, including certain costs of production and transportation. For purposes of estimating tax revenues, taxable value was estimated based on the average taxable value per unit sold from the counties in the planning area for production year 2007 using data from Wyoming Department of Revenue (Wyoming DOR 2008). Taxable value was estimated as $58.08 per barrel for oil, and $4.15 per mcf for natural gas (2007 dollars).

L.4. Livestock Grazing

Economic impacts due to changes in livestock grazing are a function of the amount of forage available and the economic value of the forage. For livestock grazing, long-term surface-disturbing actions from actions listed in Appendix T (p. 1641) could affect the authorized animal unit months (AUMs). In addition, land disposal actions could have economic impacts; however, those impacts were not analyzed quantitatively because it is difficult to predict the net change in AUMs. Subsequent landowners may continue to graze the land, leaving overall livestock production and output in the region unaffected.

The economic analysis of livestock grazing impacts is based on a long-term average (from 1989 to 2008) of actual use as a proportion of permitted use. Based on data from the BLM (BLM 2009a), actual use ranged from 51 percent to 89 percent of active use between 1989 and 2008, with an average value of 73 percent. Whereas permitted AUMs include suspended non-use AUMs, actual use represents the AUMs physically used on the ground in a given year. Actual use therefore accounts for the forage value of the land in a given year, based on climatic conditions (e.g., drought), as well as taking into account the needs of the land and the ranch operators as evidenced by how much of their full authorized amount they utilize.

Whereas reductions in land available for livestock grazing (via long-term surface disturbance or grazing withdrawal) are based on permitted AUMs, financial conditions on a given ranch

operation are determined by actual use (i.e., the actual forage value of the land that is used for livestock) and authorized use (e.g., bank loans that are based on the available forage value of federal leases held by the ranch operator). Thus, actual use is a more appropriate baseline from which to measure reductions in available AUMs due to surface disturbance or restrictions on grazing land. If reductions were measured from a baseline of permitted use, economic impacts would be overstated.

Historical analysis of data from the Lander Field Office shows that actual use in the planning area averaged 73 percent of permitted use from 1989 to 2008 (BLM 2009a). Thus, the economic analysis of livestock grazing impacts uses a baseline of 204,993 AUMs, which represents 73 percent of the permitted use of 280,813 AUMs. Reductions in AUMs due to long-term surface disturbance and grazing restrictions are also adjusted for the ratio of actual to permitted use. The 73 percent ratio is used to estimate AUMs and economic impacts for alternatives A, C, and D. For Alternative B, there would be a substantial reduction in permitted AUMs, occurring gradually over time as BLM adjusts permitted AUMs to comply with rangeland health standards. BLM believes that as these adjustments come into effect, operators would increase their actual use relative to permitted use. Therefore, in Alternative B the actual-to-permitted ratio would be somewhat higher, moving gradually from 73 percent in the first year of analysis to 95 percent in the final year of analysis.

Table L.8, "Estimated AUMs by Alternative" (p. 1591) provides a summary of initial AUMs and total AUMs for each alternative. Based on current allocations of AUMs to cattle, sheep, and other species, 91.6 percent of the AUM reduction, for the purpose of estimating changes in output and employment, is allocated to cattle and the remainder is allocated to sheep. (Approximately one percent of AUMs are allocated to horses, and a handful are allocated to goats; the value of these AUMs is assumed to be approximately equivalent to those for cattle and sheep.) BLM presently authorizes 280,813 AUMs for grazing (BLM 2009a).

Under Alternative A, BLM assumes that the present authorization will be affected only by long-term surface disturbance (i.e., due to other surface uses). Under Alternative B, the assumption is that no new range improvements will be constructed and that grazing management will meet Wyoming Standards for Healthy Rangelands. Allotments that are currently meeting standards will not be adjusted. These assumptions result in a decrease in BLM-authorized AUMs in Alternative B. For example, areas of an allotment greater than two miles from a watering facility would not be included in BLM-authorized AUMs under Alternative B, and the BLM would not build new watering facilities to provide water within two miles of these areas. As a result, areas far from an existing watering facility would not count toward BLM-authorized AUMs in Alternative B. Under Alternative C, the BLM would construct range improvements so as to facilitate the maximum number of AUMs to be available for livestock grazing. These assumptions result in somewhat lower AUMs than Alternative A, but more AUMs than in Alternative B (BLM 2010j, BLM 2011b). Under Alternative D, the BLM would construct range improvements in a fashion similar to that used for Alternative C and would also close some areas to grazing; nonetheless, surface disturbance under Alternative D would be less than that under Alternative C, so that Alternative D would result in a greater number of AUMs available in 2027. For all alternatives, reductions in AUMs over the 20-year planning horizon were modeled in IMPLAN, based on a gradual reduction over the planning timeline, rather than all at once.

Table L.8. Estimated AUMs by Alternative

Item	Alternative A	Alternative B	Alternative C	Alternative D
Permitted AUMs				
Initial AUMs	280,813	280,813	280,813	280,813
AUMs adjusted to meet rangeland health standards	0	149,364	23,432	49,696
AUMs lost due to grazing closures	0	1,873	0	1,043
AUMs lost from long-term surface-disturbing activities	1,414	853	6,890	1,301
Total AUMs lost (over 20 years)	1,414	152,054	30,322	51,808
AUMs lost per year, total	71	7,603	1,516	2,590
Net AUMs in 2027	279,399	128,759	250,491	229,005
Actual AUMs				
Estimated Percentage of Permitted AUMs	73%	73 to 95%[1]	73%	73%
Estimated Actual Use (2008)	204,993	204,993	204,993	204,993
Estimated Actual Use (2027)	203,962	122,321	182,858	167,173

Source: BLM 2010j, BLM 2011b
[1]In Alternative B, the BLM estimates that actual use relative to permitted AUMs will increase from 73 percent to 95 percent gradually over time.
Note: Acres (e.g., land affected by surface disturbance) were converted to AUMs based on total acres authorized for grazing and AUMs authorized for grazing.

AUM Animal Unit Month
BLM Bureau of Land Management

Due to price fluctuations, average per-AUM values for cattle and sheep are based on the 1998 to 2007 average value of production estimates from the Wyoming Agricultural Statistics Service (Taylor 2010). The value for cattle is $44.81 per AUM and the value for sheep is $43.38 per AUM (in 2007 dollars). Including indirect and induced impacts, the value of one AUM for cattle is $92.58 and for sheep $101.58. Table L.9, "Assumptions for Analysis of Impacts on Output for Livestock Grazing" (p. 1592) shows the economic impact assumptions for cattle and sheep. The direct economic impact is the estimated change in livestock output per AUM; IMPLAN generates the indirect and induced impacts.

Table L.9. Assumptions for Analysis of Impacts on Output for Livestock Grazing

Economic Impact	Cattle	Sheep
Direct Economic Impact ($/AUM)	$44.81	$43.38
Indirect Economic Impact ($/AUM)[1]	$35.98	$42.94
Induced Economic Impact ($/AUM)[2]	$11.76	$15.61
Total Economic Impact ($/AUM)	$92.55	$101.92
Multiplier (Total Impact/Direct Impact)	2.07	2.35

Note: All dollar values are in 2007 dollars.
[1] Indirect impacts reflect increased demand in sectors that directly or indirectly provide supplies to the livestock industry.
[2] Induced impacts reflect increased demand in the consumer and government sectors.

AUM Animal Unit Month

Table L.10, "Assumptions for Analysis of Employment Impacts for Livestock Grazing" (p. 1592) provides a summary of the employment impacts according to unit changes in livestock AUMs.

Table L.10. Assumptions for Analysis of Employment Impacts for Livestock Grazing

Employment Impact	Cattle	Sheep
Direct Employment (Jobs/1,000 AUMs)	0.466	0.980
Indirect Employment (Jobs/1,000 AUMs)	0.215	0.529
Induced Employment (Jobs/1,000 AUMs)	0.125	0.174
Total Employment (Jobs/1,000 AUMs)	0.806	1.683
Multiplier (Total Impact/Direct Impact)	1.73	1.72
Average Earnings per Job (2007 dollars)	$33,469	$17,374

Note: Direct, indirect, and induced employment impacts and average earnings per job are calculated using IMPLAN.

AUM Animal Unit Month
IMPLAN Impact Analysis for Planning

L.5. Recreation

The analysis of economic impacts considers only recreation expenditures of nonresidents of the study area. This is based on the assumption that expenditures of residents would occur in the region regardless of the BLM's actions that impact recreational opportunities; however, changes in nonresident recreation patterns would alter the amount of money entering the local region.

Economic impacts from recreation are a function of recreation visitor days (RVDs) and expenditures per day. Future RVDs were estimated based on current RVDs, recent growth rates, and projected trends. Estimates of future RVDs were based on the professional judgment of BLM staff (BLM 2010k), as well as a United States (U.S.) Forest Service (USFS) study that provides forecasts of recreation activity for the Rocky Mountain region (Bowker et al. 1999). Table L.11, "Estimated Nonresident Recreation Visitor Days" (p. 1593) provides a summary of estimated annual RVDs.

Table L.11. Estimated Nonresident Recreation Visitor Days

Activity	Item	Alternative A	Alternative B	Alternative C	Alternative D
OHV	2008 RVDs	1,283	1,283	1,283	1,283
	2013 RVDs	1,571	1,717	1,487	1,637
	2018 RVDs	1,923	2,298	1,724	2,090
	2023 RVDs	2,354	3,075	1,999	2,667
	2027 RVDs	2,767	3,882	2,250	3,242
	Average Annual Growth Rate	4.1%	6.0%	3.0%	5.0%
Hunting	2008 RVDs	7,900	7,900	7,900	7,900
	2013 RVDs	10,627	11,608	10,627	10,083
	2018 RVDs	14,295	17,056	14,295	12,868
	2023 RVDs	19,230	25,060	19,230	16,424
	2027 RVDs	24,378	34,094	24,378	19,963
	Average Annual Growth Rate	6.1%	8.0%	6.1%	5.0%
Fishing	2008 RVDs	600	600	600	600
	2013 RVDs	774	730	803	842
	2018 RVDs	997	888	1,075	1,180
	2023 RVDs	1,286	1,081	1,438	1,655
	2027 RVDs	1,576	1,264	1,815	2,170
	Average Annual Growth Rate	5.2%	4.0%	6.0%	7.0%
Other Dispersed Recreation	2008 RVDs	66,185	66,185	66,185	66,185
	2013 RVDs	88,871	101,834	84,471	97,247
	2018 RVDs	119,333	156,684	107,808	142,888
	2023 RVDs	160,235	241,078	137,594	209,950
	2027 RVDs	202,842	340,301	167,246	285,635
	Average Annual Growth Rate	6.1%	9.0%	5.0%	8.0%

Source: BLM 2010k

OHV Off-highway vehicle
RVD recreation visitor days

The estimates for average expenditure per visitor day, in 2007 dollars, are $85.72 for fishing (WGFD 2008, USFWS 2008b); $130.34 for hunting (Responsive Management 2004); $52.18 for off-highway vehicle (OHV) use (Foulke et al. 2006), and $57.71 for other dispersed recreation (Stynes and White 2003). Table L.12, "Assumptions for Analysis of Impacts on Output for Recreation Activities" (p. 1594) shows the direct, indirect, and induced output per RVD for each recreation activity, in 2007 dollars.

Table L.12. Assumptions for Analysis of Impacts on Output for Recreation Activities

Economic Impact	OHV (per RVD)	Hunting (per RVD)	Fishing (per RVD)	Other Dispersed (per RVD)
Direct Economic Impact[1]	$52.18	$130.34	$85.72	$57.71
Indirect Economic Impact[2]	$7.40	$31.60	$11.70	$8.63
Induced Economic Impact[3]	$6.11	$22.72	$11.19	$7.26
Total Economic Impact	$65.69	$184.67	$108.61	$73.60
Multiplier (total impact/direct impact)	1.26	1.42	1.27	1.28

Sources: WGFD 2008, USFWS 2008b, Responsive Management 2004, Foulke et al. 2006, Stynes and White 2003, Taylor 2010.
Note: Detail may not add to total due to rounding.
[1]Direct economic impact is the average expenditure per visitor day.
[2]Indirect impacts from IMPLAN reflect increased demand in sectors that directly or indirectly provide support for the recreation industry.
[3]Induced impacts from IMPLAN reflect increased demand in the consumer and government sectors.

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Table L.13, "Assumptions for Employment Impacts Analysis for Recreation Activities" (p. 1594) provides a summary of employment impacts assumed according to unit changes in RVDs.

Table L.13. Assumptions for Employment Impacts Analysis for Recreation Activities

Employment Impact (annual number of jobs)	OHV (per 1,000 RVDs)	Hunting (per 1,000 RVDs)	Fishing (per 1,000 RVDs)	Other Dispersed (per 1,000 RVDs)
Direct Employment	0.58	1.89	1.02	0.64
Indirect Employment	0.06	0.26	0.09	0.07
Induced Employment	0.06	0.22	0.10	0.07
Total Employment	0.70	2.37	1.22	0.78
Multiplier (Total Impact/Direct Impact)	1.21	1.26	1.19	1.22
Average Earnings per Job (2007 dollars)	$20,486	$22,399	$21,547	$21,858

Note: Direct, indirect, and induced employment impact and average earnings per job are calculated using IMPLAN.

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