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Impacts of Visitor Spending on the Local Economy

Mesa Verde National Park, 2012

Natural Resource Report NPS/NRSS/EQD/NRR—2013/XXX

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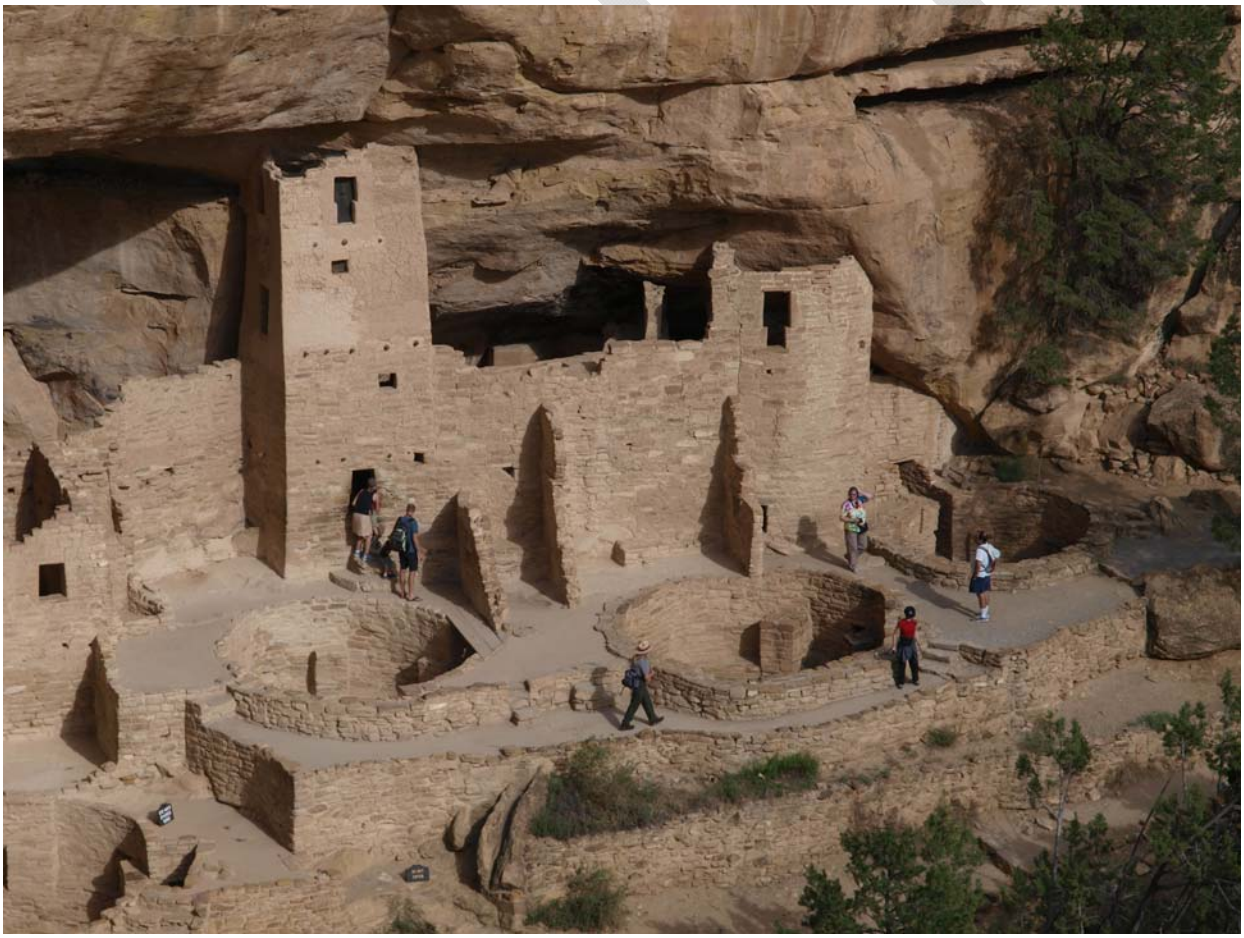

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ON THE COVER
Cliff dwellings at Mesa Verde National Park
Photograph by Park Studies Unit staff

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Executive Summary

Mesa Verde National Park hosted 488,860 recreation visits in 2012. Adjustments for visitor group size and re-entries resulted in 138,026 visitor group trips to the park in 2012. Based on a 2012 Visitor Services Project survey conducted July 27–August 2, 27% of these visitor group trips were made by local residents or non-locals on day trips, not including an overnight stay within 50 miles of the park.[1] Thirty-nine percent of visitor group trips involved an overnight stay in a lodge, hotel, motel, cabin, B&Bs, etc. outside the park but within 50 miles of the park.

Visitors reported their group's expenditures in the park and within 50 miles of the park. The average visitor group size was 3.3 people and spent an average of $341in the park and within 50 miles of the park.

Total visitor spending in 2012 in the park and within 50 miles of the park was $47.1 million. The greatest proportions of expenditures were for overnight accommodations (36%) and restaurants and bars (18%). Overnight visitors staying in a lodge, hotel, motel, cabin, B&B, etc. outside the park but within 50 miles of the park accounted for 73% of total spending.

Fifty-six percent of visitor groups indicated the park visit was the primary reason for their trip to the area. Counting only a portion of visitor expenses if the park visit was not the primary reason for the trip yields $39.0 million in spending attributed directly to the park.

The economic impact of park visitor spending was estimated by applying the spending to an input-output model of the local economy. The local region was defined as Montezuma County, Colorado, which roughly coincides with the 50-mile radius from the park for which expenditures were reported.

Including direct and secondary effects, the $39.0 million in visitor spending attributed to the park generated $41.9 million in direct sales in the region, which supported 567 jobs. These jobs paid $11.9 million in labor income, which was part of $24.1 million in value added to the region.[2]

A separate study estimated impacts of the park employee payroll on the local economy in FY 2010[3], and the results are reported herein. The park itself employed 131 people in FY 2010 with a total payroll including benefits of $7.1 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were $2.5 million in sales, supporting 154 jobs, $7.9 million in labor income, and $8.7 million in value added.

Local Economic Impacts of Mesa Verde National Park

	Sales	Jobs	Labor Income	Value Added
Park Visitor Spending	$41.9M	567	$11.9M	$24.1M
Park Payroll	+ $2.5M	+154	+ $7.9M	+ $8.7M
Park Visitor Spending + Payroll	$44.4M	721	$19.8M	$32.8M

[1] Results in this study sometimes differ from those reported in the VSP study report (Begly et al. 2013) because of the omission of cases considered to be outliers in the current analysis. See Study Limitations and Errors section.
[2] Jobs include fulltime and part-time jobs. Labor income consists of wages and salaries, payroll benefits and income of sole proprietors. Value added includes labor income as well as property income (dividend, royalties, interest and rents) to area businesses and indirect business taxes (sales, property, and excise taxes).
[3] Stynes (2011).

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Introduction

Mesa Verde National Park (NP) preserves the cliff dwellings of Ancestral Pueblo people who inhabited the area from A.D. 600 to 1300. The park was designated as a national park in 1906, and is located in Montezuma County, Colorado. Mesa Verde NP received 448,860 recreation visits in 2012 including 63,827 overnight stays (Table 1).

Table 1. Recreation visits and overnight stays, Mesa Verde NP, 2012

		Overnight stays		
Month	**Recreation visits**	**Lodging**	**Camping***	**Total**
January	6,288	0	0	0
February	5,771	0	0	0
March	14,411	0	0	0
April	25,245	0	100	100
May	51,503	3,909	5,981	9,890
June	85,908	3,919	9,909	13,828
July	98,574	4,062	8,702	12,764
August	81,558	3,717	7,335	11,052
September	60,439	4,033	7,359	11,392
October	40,982	2,129	2,672	4,801
November	10,620	0	0	0
December	7,561	0	0	0
Total	**488,860**	**21,769**	**42,058**	**63,827**

*Includes group campers.
Source: NPS Public Use Statistics 2012.

The purpose of this study is to estimate the annual, local economic impacts of visitors to Mesa Verde NP in 2012. Economic impacts were measured as the direct and secondary sales, income, and jobs in the local region resulting from spending by park visitors. (See Appendix A: Glossary for definitions of terms.) In addition, a separate study estimated the impacts of the NPS park payroll on the local region (Stynes 2011), and those results are reported herein. Neither study estimated the economic impacts of park operations or construction spending on the local region.

The local economic region defined for this study included Montezuma County, Colorado. This one-county region had a population of 25,372 (USCB 2012), gross regional product of $706.6 million (MIG, Inc. 2008), median household income of $45,776, and family poverty rate of 14.0% (USCB 2012). State and local governments, including education, were the major employers in the region (MIG, Inc. 2008), and the region experienced a 8.5% unemployment rate in 2012 (BLS 2012).

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Methods

The economic impact estimates were produced using the Money Generation Model 2 (MGM2) (Stynes et al. 2007). The three main inputs to the model were:

1. number of visits broken down by lodging-based segments;
2. spending averages for each segment; and
3. economic multipliers for the local region.

Inputs were estimated from the Mesa Verde NP Visitor Services Project (VSP) survey data (Begly et al. 2013), National Park Service Public Use Statistics (2012), and IMPLAN input-output modeling software (MIG, Inc. 2008). The MGM2 model provides a spreadsheet template for combining park use, spending, and regional multipliers to compute changes in sales, labor income, jobs, and value added in the region.

The VSP visitor survey was conducted at Mesa Verde NP from July 27–August 2, 2012.[4] The VSP survey measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a systematic, random sample of 676 visitor groups. Visitors returned 477 questionnaires resulting in a response rate of 70.5%.

Spending and economic impact estimates for Mesa Verde NP are based in part on the 2012 VSP survey data. Visitors were asked to report expenditures inside the park and within 50 miles of the park. The local region for determining economic impact was defined as Montezuma County, Colorado, which includes the park and roughly approximates the 50-mile radius around the park for which expenditures were reported.

The MGM2 model divides visitors into segments to help explain differences in spending across distinct user groups. Seven segments were established for Mesa Verde NP visitors based on reported trip characteristics and lodging expenditures:

Local: Visitors that were residents of the local region, i.e., within 50 miles of the park.

Day trip: Visitors from outside the local region, that did not stay overnight in the local region.

Motel-in: Visitors who reported motel expenses within the park.[5]

Camp-in: Visitors who reported camping expenses within the park.

Motel-out: Visitors who reported motel expenses outside the park, but within 50 miles of the park.

Camp-out: Visitors who reported camping expenses outside the park, but within 50 miles of the park.

[4] Results in this study sometimes differ from those reported in the VSP study report (Begly et al. 2013) because of the omission of cases considered to be outliers in the current analysis. See Study Limitations and Errors section.

[5] The questionnaire asked about expenditures for "Lodge, hotel, motel, cabin, B&B, etc." For convenience, these expenditures are referred to as "motel" in this report. The Far View Lodge is the only motel inside the park.

Other overnight (Other OVN): Non-local visitors who stayed overnight in the local region, but did not report any lodging expenses. This segment included visitors who stayed in private homes, with friends or relatives, or in other unpaid lodging.[6]

The VSP survey data were used to estimate the percentage of visitors from each segment as well as spending averages, lengths of stay, and visitor group sizes for each segment. Segment shares from the VSP survey were adjusted to be consistent with the park's NPS Public Use Statistics (2012) overnight stay figures.

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[6] Visitors reporting multiple lodging types and expenditures were classified based on the greatest reported lodging expense. Some visitors listing motels or campgrounds as lodging types did not report any lodging expenses and were classified in the other overnight (Other OVN) category.

Results

Visits

Based on VSP survey data, 26% of park entries were classified as day visits either by residents or by visitors from outside the local region (Table 2). The remaining 74% were classified as overnight visits including an overnight stay in the local region. The average visitor group size ranged from 2.6 to 3.9 people across the seven segments with an average visitor group of 3.3 people.[7] The average length of stay in the local region on overnight trips was 2.1 nights. Fifty-six percent of visitor groups indicated that visiting the park was the primary reason for their trip to the area.

Table 2. Selected visit/trip characteristics by segment, 2012

	Segment							
Characteristic	**Local**	**Day trip**	**Motel-in**	**Camp-in**	**Motel-out**	**Camp-out**	**Other OVN**	**All visitors**
Visitor segment share (park entries)	2%	24%	3%	6%	38%	7%	20%	100%
Average visitor group size	2.6	3.3	3.5	3.2	3.2	3.9	3.3	3.3
Length of stay (days or nights)	1.0	1.0	1.9	2.0	1.9	2.4	2.4	2.1
Re-entry rate (park entries per trip)	1.0	1.0	1.1	1.2	1.1	1.1	1.1	1.1
Percent primary purpose trips	100%	51%	59%	64%	59%	58%	46%	56%

The 448,860 recreation visits in 2012 were allocated to the seven segments using the visit segment shares in Table 2. Because spending was reported for the stay in the area, recreation visits were converted to visitor group trips to the area by dividing recreation visits by the average number of times each visitor entered the park during their stay and the average visitor group size. The 448,860 recreation visits represented 138,026 visitor group trips (Table 3).

Table 3. Recreation visits and visitor group trips by segment, 2012

	Segment							
Measure	**Local**	**Day trip**	**Motel-in**	**Camp-in**	**Motel-out**	**Camp-out**	**Other OVN**	**All visitors**
Recreation visits	9,777	117,326	14,666	29,332	185,767	34,220	97,772	488,860
Visitor group trips	3,802	33,564	3,864	7,537	53,777	7,953	27,529	138,026
Percent of visitor group trips	3%	24%	3%	5%	39%	6%	20%	100%

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[7] Visitor group size reported herein is based on the number of people covered by expenditures reported in the VSP survey.

Visitor Spending

The VSP survey collected data about expenditures of visitor groups inside the park and within 50 miles of the park.[8] Spending averages were computed on a visitor group trip basis for each segment. The average visitor group spent $341.25 on the trip, including expenditures inside the park and within 50 miles of the park (Table 4). On a visitor group trip basis, average spending was $31.50 for day trips by local residents and $102.41 for day trips by non-local visitors. Visitor groups staying in the motel in the park spent an average of $569.35 on their trips, while those staying in motels outside the park spent $639.14. Those camping inside the park spent an average of $217.81 on their trips, while those camping outside the park spent $516.50. Visitor groups spent about 84% of their total spending outside the park.

Table 4. Average spending by segment (dollars per visitor group per trip)

	Segment							
Expenditures	**Local**	**Day trip**	**Motel-in**	**Camp-in**	**Motel-out**	**Camp-out**	**Other OVN**	**All visitors***
Inside Park								
Motel	0.00	0.00	237.79	0.00	6.90	0.00	0.00	9.34
Camping fees	0.00	0.00	0.00	46.80	1.17	1.07	0.00	3.07
Restaurants & bars	7.50	8.45	142.26	13.35	9.77	5.05	5.84	12.23
Groceries & takeout food	1.25	0.19	15.44	10.51	2.12	0.99	0.31	2.03
Gas & oil	0.00	0.68	18.51	12.84	2.89	2.37	0.00	2.65
Local transportation	0.00	0.00	14.05	14.02	1.26	0.00	0.00	1.65
Admission & fees	0.00	8.53	38.99	28.43	13.92	36.83	3.94	13.05
Souvenirs & other expenses	18.75	8.26	34.11	28.84	12.78	14.99	2.96	11.49
Total Inside Park	**27.50**	**26.11**	**501.15**	**154.80**	**50.82**	**61.29**	**13.04**	**55.52**
Outside Park								
Motel	0.00	0.00	13.31	0.00	263.10	0.00	0.00	102.88
Camping fees	0.00	0.00	0.00	1.07	2.08	100.44	0.00	6.66
Restaurants & bars	0.00	16.02	14.71	7.33	102.03	47.57	9.39	49.07
Groceries & takeout food	1.38	9.58	3.64	15.61	25.82	62.07	7.32	18.42
Gas & oil	2.50	22.92	22.23	25.11	69.83	135.00	6.34	43.89
Local transportation	0.00	8.66	8.84	4.80	45.00	15.79	1.88	21.43
Admission & fees	0.00	15.00	0.93	6.11	54.59	65.13	0.60	29.15
Souvenirs & other expenses	0.13	4.12	4.55	2.99	25.88	29.21	5.85	14.23
Total Outside Park	**4.00**	**76.31**	**68.20**	**63.01**	**588.33**	**455.21**	**31.38**	**285.72**
Total Inside & Outside Park	**31.50**	**102.41**	**569.35**	**217.81**	**639.14**	**516.50**	**44.43**	**341.24**

*Weighted by percent visitor group trips.

[8] Some expenditure categories in the VSP questionnaire were combined for reporting herein and MGM2 analysis. See Appendix B.

The relative standard error at a 95% confidence level for the overall spending average was 12%. A 95% confidence interval for the overall visitor group spending average was therefore $341.24 plus or minus $42.30 or between $298.94 and $383.54.

On a per night basis, visitor groups staying in the motel in the park spent $300.20 in the local region, while visitor groups staying in motels outside the park spent $332.70 per night (Table 5). The average reported per-night lodging expense was $132.39 for the motel inside the park and $140.55 for motels outside the park.

Table 5. Average spending per night for visitor groups on overnight trips (dollars per visitor group per night)

	Segment				
Expenditures	**Motel-in**	**Camp-in**	**Motel-out**	**Camp-out**	**Other OVN**
Motel	132.39	0.00	140.55	0.00	0.00
Camping fees	0.00	23.57	1.69	42.45	0.00
Restaurants & bars	82.77	10.19	58.20	22.00	6.46
Groceries & takeout food	10.06	12.86	14.54	26.37	3.24
Gas & oil	21.48	18.69	37.86	57.44	2.69
Local transportation	12.07	9.27	24.08	6.60	0.80
Admission & fees	21.05	17.01	35.66	42.64	1.92
Souvenirs & other expenses	20.38	15.68	20.13	18.49	3.74
Total per visitor group per night	**300.20**	**107.28**	**332.70**	**215.99**	**18.86**

Total spending was estimated by multiplying the number of visitor group trips for each segment by the average spending per trip and summing across segments. Mesa Verde NP visitors spent a total of $47.1 million in the local region in 2012 (Table 6). Visitors who stayed in motels outside the park accounted for 73% of the total spending. Motel expenses represented 33% of total spending (Figure 1).

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Table 6. Total visitor spending by segment, 2012 (thousands of dollars)

	Segment							
Expenditures	**Local**	**Day trip**	**Motel-in**	**Camp-in**	**Motel-out**	**Camp-out**	**Other OVN**	**All visitors**
Inside Park								
Motel	0	0	919	0	371	0	0	1,290
Camping fees	0	0	0	353	63	8	0	424
Restaurants & bars	29	284	550	101	525	40	161	1,689
Groceries & takeout food	5	6	60	79	114	8	9	280
Gas & oil	0	23	72	97	156	19	0	366
Local transportation	0	0	54	106	68	0	0	228
Admission & fees	0	286	151	214	749	293	108	1,801
Souvenirs & other expenses	71	277	132	217	687	119	81	1,586
Total Inside Park	**105**	**876**	**1,936**	**1,167**	**2,733**	**487**	**359**	**7,663**
Outside Park								
Motel	0	0	51	0	14,149	0	0	14,200
Camping fees	0	0	0	8	112	799	0	919
Restaurants & bars	0	538	57	55	5,487	378	259	6,773
Groceries & takeout food	5	322	14	118	1,388	494	202	2,542
Gas & oil	10	769	86	189	3,755	1,074	175	6,057
Local transportation	0	291	34	36	2,420	126	52	2,958
Admission & fees	0	503	4	46	2,936	518	16	4,023
Souvenirs & other expenses	0	138	18	23	1,392	232	161	1,964
Total Outside Park	**15**	**2,561**	**264**	**475**	**31,638**	**3,620**	**864**	**39,437**
Total Inside & Outside Park	**120**	**3,437**	**2,200**	**1,642**	**34,371**	**4,108**	**1,223**	**47,100**
Segment Percent of Total	0%	7%	5%	3%	73%	9%	3%	100%

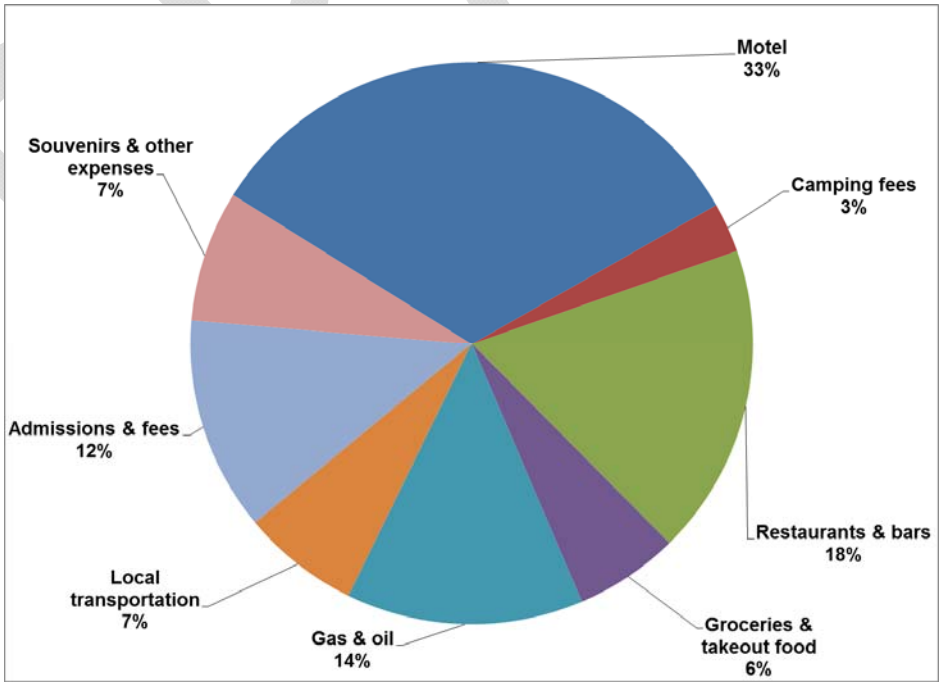

Figure 1. Mesa Verde NP visitor spending by category

Because visitors would come to the region whether or not the park existed, not all visitor spending can be attributed to the park. Forty-four percent of visitor groups did not make the trip primarily to visit Mesa Verde NP. Spending directly attributed to park visits was estimated by counting all spending on trips for which the park was the primary reason for the trip. If the park was not the primary trip purpose, one night of spending was counted for overnight trips and half of the spending in the region was counted for day trips. With these assumptions, a total of $39.0 million in visitor spending was attributed to the park visit (Table 7). This represented 83% of the overall visitor spending total.

Table 7. Total spending attributed to park visits, 2012 (thousands of dollars)

	Segment							
Expenditures	**Local**	**Day trip**	**Motel-in**	**Camp-in**	**Motel-out**	**Camp-out**	**Other OVN**	**All visitors**
Motel	0	0	960	0	11,756	0	0	12,716
Camping fees	0	0	0	359	153	614	0	1,126
Restaurants & bars	29	690	595	146	4,940	327	339	7,065
Groceries & takeout food	5	249	71	175	1,231	382	147	2,261
Gas & oil	0	605	141	251	3,177	832	120	5,126
Local transportation	0	220	82	135	2,015	95	36	2,583
Admission & fees	0	667	154	252	3,111	685	120	4,988
Souvenirs & other expenses	71	382	146	236	1,807	295	192	3,129
Total Attributed to Park	**105**	**2,813**	**2,148**	**1,554**	**28,191**	**3,230**	**953**	**38,994**
Percent of Spending Attributed to the Park	87%	82%	98%	95%	82%	79%	78%	83%
Percent of Attributed Spending	<1%	7%	6%	4%	72%	8%	2%	100%

Economic Impacts of Visitor Spending

The economic impacts of Mesa Verde NP visitor spending on the local economy were estimated by applying visitor spending to a set of economic ratios and multipliers in MGM2 representing the economy of Montezuma County, Colorado.[9] Economic ratios and multipliers for the region were estimated using the *Impact Analysis for Planning (IMPLAN) Professional software* (version 3, MIG, Inc. 2008) with 2010 data.[10] Multipliers were adjusted to 2012 based on price changes between 2010 and 2012 (see Study Limitations and Errors section below).

Not all visitor spending was counted as direct sales to the region. The amount a visitor spends for a retail good is made up of the cost of the good from the producer, a markup by a wholesaler, and a markup by a retailer. In MGM2, retail and wholesale margins for grocery & takeout food, gas & oil, and souvenirs & other expenses were applied to visitor spending to account for mark-ups by retailers and wholesalers. The retail margins for the three sectors were 25.3%, 22.3%, and 50.0%, respectively, and the wholesale margins were 12.3%, 8.3%, and 11.4%. In addition, regional purchase coefficients from IMPLAN for all sectors were used to account for the proportion of demand within the region satisfied by imports into the region.

[9] Economic ratios convert between various economic measures, e.g., direct spending to the directly associated jobs, labor income, and value added in each sector. Economic multipliers capture the secondary effects of economic measures.

[10] See Appendix C: Economic Ratios and Multipliers for the region.

The tourism output sales multiplier for the region is 1.31. Every dollar of direct sales to visitors generated another $0.31 in secondary sales through indirect and induced effects.[11] (See Appendix A: Glossary for further explanation of terms.)

The economic impacts to the local region are presented in two ways: (1) based on all visitor spending and (2) based only on visitor spending attributable to the park. The first estimate—including all visitor spending—shows the overall contribution park visitors make to the local region. The second estimate—including only visitor spending attributable to the park—shows the impact or contribution the park makes to the economy of the local region.

Impacts of All Visitor Spending

Using all visitor spending and including direct and secondary effects, the $47.1 million spent by park visitors generated $50.5 million in sales, which supported 679 jobs in the local region (Table 8). These jobs paid $14.4 million in labor income, which was part of $29.1 million in value added to the region.[12]

Table 8. Impacts of all visitor spending on the local economy, 2012

Sector/Expenditure category	Sales (thousands of dollars)	Jobs	Labor Income (thousands of dollars)	Value Added (thousands of dollars)
Direct Effects				
Motels	15,490	169	3,828	8,468
Camping fees	1,343	18	321	600
Restaurants & bars	8,462	164	2,599	4,346
Groceries & takeout food	5,824	130	528	2,913
Gas & oil	3,186	22	2,395	2,821
Local transportation	714	12	349	516
Admission & fees	1,432	18	659	1,038
Souvenirs & other expenses	1,775	34	846	1,347
Wholesale trade	452	3	130	325
Local production of goods	0	0	0	0
Total Direct Effects	**38,679**	**571**	**11,655**	**22,374**
Secondary Effects	11,813	108	2,784	6,689
Total Effects	**50,492**	**679**	**14,438**	**29,063**

Note: Impacts of $47.1 million in visitor spending reported in Table 6. Totals may not equal sum of individual categories due to rounding.

Value added is the preferred measure of the contribution of visitors to the local economy as it includes all sources of income to the area—payroll benefits to workers, profits and rents to businesses, and sales and other indirect business taxes that accrue to government units. Value added impacts are also comparable to Gross Regional Product, the broadest measure of total economic activity in a region. The largest direct effects are in motels and restaurants & bars.

[11] Indirect effects result from tourism businesses buying goods and services from local firms, while induced effects stem from household spending of income earned from visitor spending.

[12] Jobs include full and part time jobs. Labor income consists of wages and salaries, payroll benefits and income of sole proprietors. Value added includes labor income as well as profits and rents to area businesses and sales and excise taxes.

Impacts of Visitor Spending Attributed to the Park

Using only visitor spending attributable to the park by including only some spending on trips where the primary trip purpose was not to visit Mesa Verde NP reduced the overall impacts by about 17% (Table 9; see spending inclusion assumptions in previous section). Including direct and secondary effects, the $39.0 million spent by park visitors and attributable to the park generated $41.9 million in sales, which supported 567 jobs in the local region. These jobs paid $11.9 million in labor income, which was part of $24.1 million in value added to the region.

Table 9. Economic impacts of visitor spending attributed to the park, 2012

Sector/Expenditure category	**Sales** (thousands of dollars)	**Jobs**	**Labor Income** (thousands of dollars)	**Value Added** (thousands of dollars)
Direct Effects				
Motels	12,716	139	3,143	6,952
Camping fees	1,126	15	269	503
Restaurants & bars	7,065	137	2,170	3,628
Groceries & takeout food	4,988	111	452	2,495
Gas & oil	2,583	18	1,941	2,287
Local transportation	572	9	280	413
Admission & fees	1,143	15	526	828
Souvenirs & other expenses	1,565	30	746	1,187
Wholesale trade	373	3	107	268
Local production of goods	0	0	0	0
Total Direct Effects	**32,131**	**477**	**9,634**	**18,563**
Secondary Effects	9,799	89	2,308	5,550
Total Effects	**41,930**	**567**	**11,942**	**24,113**

Note: Impacts of $39.0 million in visitor spending attributed to park reported in Table 7. Totals may not equal sum of individual categories due to rounding.

Economic Impacts of the NPS Park Payroll

In addition to visitor spending, spending by park employees also impacts the local region. A separate study (Stynes 2011) estimated the impacts of park payroll in FY 2010 by applying economic multipliers to wage and salary data to capture the induced effects of NPS employee spending on local economies. Mesa Verde NP itself employed 131 people in FY 2010 with a total payroll including benefits of $7.1 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were $2.5 million in sales, 154 jobs, $7.9 million in labor income, and $8.7 million value added (Stynes 2011).

Combined Economic Impacts

The combined impacts to the region of visitor spending attributable to the park and NPS payroll were $44.4 million in sales, which supported 721 jobs with labor income of $19.8 million, which was part of a total value added of $32.8 million.

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Study Limitations and Errors

The accuracy of the MGM2 estimates rests on the accuracy of three inputs: visits, spending averages, and multipliers. Visits were taken from NPS Public Use Statistics (2012). Recreation visit estimates rely on counting procedures at the park, which may miss some visitors and count others more than once during their visit. Re-entry rates are important to adjust the park visit counts to reflect the number of visitor group trips to the region rather than park entries. Re-entry rates were estimated based on visitor responses to a VSP survey question about the number of times the visitor entered the park.

Spending averages outside the park were derived from the 2012 Mesa Verde NP VSP survey data (Begly et al. 2013). Estimates from the survey are subject to sampling errors, measurement errors, and potential seasonal biases. The overall spending average is subject to sampling error of 12%.

Spending averages are also sensitive to decisions about outliers and treatment of missing data. In order to estimate spending averages, incomplete spending data were filled with zeros. Visitor groups visiting the local region for more than 10 nights (5 cases), or spending greater than $2,938 (the mean plus two times the standard deviation of the mean for spending, 9 cases) were omitted from the analysis. These are conservative assumptions about outliers and likely result in conservative estimates of economic impacts.

The sample only covers visitors during one week at the end of July and beginning of August. To extrapolate to annual totals, it was assumed that this sample represented visitors throughout the year.

Multipliers were derived from an input-output model of the local economy using IMPLAN (MIG, Inc. 2008). The basic assumptions of input-output models are that sectors have homogeneous, fixed and linear production functions, that prices are constant, and that there are no supply constraints. The IMPLAN system uses national average production functions for each of 440 sectors based on the NAICS system (see Appendix B, Table B2). The most recent local IMPLAN datasets available for this analysis were 2010. Local employment multipliers were updated to 2012 based on changes in consumer price indices.

Sorting out how much spending to attribute to the park when the park is not the primary reason for the trip is somewhat subjective. Because 44% of visitors to Mesa Verde NP did not make the trip primarily to visit the park and 84% of all spending occurred outside the park, adjustments for non-primary purpose trips have a significant effect on the overall spending and impact estimates.

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Appendix A: Glossary

Term	Definition
Direct effects	Changes in sales, income and jobs in those business or agencies that directly receive visitor spending.
Economic multiplier	Captures the size of secondary effects and are usually expressed as a ratio of total effects to direct effects.
Economic ratio	Converts various economic measures from one to another. For example, direct sales can be used to estimate direct effects on jobs, personal income, and value added by applying economic ratios. That is: • Direct jobs = direct sales * jobs to sales ratio • Direct personal income = direct sales * personal income to sales ratio • Direct value added = direct sales * value added to sales ratio.
Indirect effects	Changes in sales, income and jobs in industries that supply goods and services to the businesses that sell directly to visitors, i.e., businesses in the supply chain. For example, linen suppliers benefit from visitor spending at motels.
Induced effects	Changes in economic activity in the region resulting from household spending of income earned through a direct or indirect effect of visitor spending. For example, motel and linen supply employees live in the region and spend their incomes on housing, groceries, education, clothing and other goods and services. IMPLAN's Social Accounting Matrix (SAM) multipliers also include induced effects resulting from local/state/federal government spending.
Jobs	The number of jobs in the region supported by visitor spending. Job estimates are not full time equivalents, but include both fulltime and part-time positions.
Labor income	Wage and salary income, sole proprietor (business owner) income and employee payroll benefits.
Regional purchase coefficient (RPC)	The proportion of demand within a region supplied by producers within that region.
Retail margin	The markup to the price of a product when a product is sold through a retail trade activity. Retail margin is calculated as sales receipts minus the cost of goods sold.
Sales	Direct sales (retail goods and services) of firms within the region to park visitors.

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Term	Definition
Secondary effects	Changes in the economic activity in the region that result from the re-circulation of money spent by visitors. Secondary effects include indirect and induced effects.
Total effects	Sum of direct, indirect and induced effects. • Direct effects accrue largely to tourism-related businesses in the area. • Indirect effects accrue to a broader set of businesses that serve these tourism firms. • Induced effects are distributed widely across a variety of local businesses.
Value added	Labor income plus property income (rents, dividends, royalties, interest) and indirect business taxes. As the name implies, it is the net value added to the region's economy. For example, the value added by a motel includes wages and salaries paid to employees, their payroll benefits, profits of the motel, and sales, property, and other indirect business taxes. The motel's non-labor operating costs such as purchases of supplies and services from other firms are not included as value added by the motel.
Visitor group	A group of people traveling together to visit the park. Visitor group is the basic sampling unit for VSP surveys; each visitor group receives only one questionnaire.
Wholesale margin	The markup to the price of a product when a product is sold through wholesale trade. Wholesale margin is calculated as wholesale sales minus the cost of the goods sold.

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Appendix B: Expenditure Sector Assignments

Table B1 shows expenditure categories visitors were asked to estimate in the Mesa Verde NP VSP questionnaire. Some expenditure categories were combined and renamed for MGM2 analysis.

Table B1. Expenditure categories in Mesa Verde NP questionnaire and MGM2 sector assignment

Questionnaire expenditure categories	Inside park	Outside park	MGM2 sector
Lodge, hotel, motel, cabin, B&B, etc.	X	X	Motel
Camping fees and charges	X	X	Camping fees
Guide fees and charges	X	X	Admissions & fees
Restaurants and bars	X	X	Restaurants & bars
Groceries and takeout food	X	X	Groceries & takeout food
Gas and oil (auto, RV, boat, etc.)	X	X	Gas & oil
Other transportation expenses (rental cars, taxis, auto repairs, but NOT airfare)	X	X	Local transportation
Admission, recreation, entertainment fees	X	X	Admissions & fees
All other purchases (souvenirs, books, postcards, sporting goods, clothing, donations, etc.)	X	X	Souvenirs & other expenses

X = category included in questionnaire.

MGM2 sectors names correspond to similar sector names and numbers in IMPLAN (Table B2). IMPLAN sectors also correspond to 2007 North American Industry Classification System (NAICS) sectors.

Table B2. MGM2 sector correspondence to IMPLAN and 2007 NAICS sectors

	IMPLAN		
MGM2 sector	**No.**	**Name**	**2007 NAICS**
Motels	411	Hotels and motels, including casino hotels	72111-2
Camping fees	412	Other accommodations	72119, 7212-3
Restaurants & bars	413	Food services and drinking places	722
Groceries & takeout food	324	Retail - Food and beverage	445
Gas & oil	326	Retail - Gasoline stations	447
Local transportation	336	Transit and ground passenger transportation	485
Admissions & fees	410	Other amusement and recreation industries	71391-3, 71399
Souvenirs & other expenses	329	Retail - General merchandise	452
Local production of goods	69	All other food manufacturing	31199
	88	Men's and boys' cut and sew apparel manufacturing	31522
	115	Petroleum refineries	32411
	311	Sporting and athletic goods manufacturing	33992
	317	All other miscellaneous manufacturing	339993, 339995, 339999
Wholesale trade	319	Wholesale trade	42

Source: IMPLAN (MIG, Inc. 2008).

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Appendix C: Economic Ratios and Multipliers

Table C1. Economic ratios and multipliers for selected tourism-related sectors, Mesa Verde NP region, 2012

	Direct effects			Total effects multipliers				
Sector	**Jobs/ $MM sales**	**Income/ sales**	**Value added/ sales**	**Sales I**	**Sales SAM**	**Job II/ $MM sales**	**Income II/ sales**	**Value added II/ sales**
Motel, hotel, cabin or B&B	10.47	0.25	0.55	1.17	1.31	13.39	0.33	0.73
Camping fees	12.97	0.24	0.45	1.21	1.35	16.29	0.33	0.65
Restaurants & bars	18.39	0.31	0.51	1.13	1.29	20.97	0.38	0.69
Groceries & takeout food	15.43	0.49	0.72	1.12	1.36	18.62	0.58	0.94
Gas & oil	9.88	0.46	0.72	1.12	1.34	12.93	0.54	0.93
Local transportation	6.25	0.75	0.89	1.02	1.37	9.66	0.85	1.11
Admission & fees	21.72	0.09	0.50	1.19	1.25	23.87	0.15	0.65
Souvenirs & other expenses	18.09	0.48	0.76	1.10	1.34	21.08	0.56	0.96
Local production of goods	5.61	0.13	0.36	1.10	1.18	7.11	0.18	0.47
Wholesale trade	6.78	0.29	0.72	1.09	1.24	8.94	0.35	0.86

Source: IMPLAN (MIG, Inc. 2008), updated to 2012.

Explanation of table

Direct effects are economic ratios to convert sales in each sector to jobs, income and value added.

Jobs/$MM sales is jobs per million dollars in sales.
Income/sales is the percentage of sales going to wages, salaries, and employee benefits.
Value added/sales is the percentage of sales that is value added (Value added covers all income, rents and profits and indirect business taxes).

Total effects are multipliers that capture the total effect relative to direct sales.

Sales I captures only direct and indirect sales.
Sales SAM is the SAM sales multiplier = (direct + indirect + induced sales) /direct sales.
Job II/$MM sales = total jobs (direct + indirect + induced) per $ million in direct sales.
Income II /sales = total income (direct + indirect + induced) per $ of direct sales.
Value added II/sales = total value added (direct + indirect + induced) per $ of direct sales.

Using the motels sector row to illustrate

Direct Effects: Every million dollars in motel sector sales (i.e., short-term lodging room rentals) creates 10.5 jobs in the motel sector. Fifty-five percent of motel sector sales are value added, including 25% that goes to wages and salaries of motel employees. That means 45% of motel sector sales goes to purchase inputs by motels (e.g., linens, cleaning supplies). The wage and salary income creates the induced effects, and the 45% of sales spent on purchases by motels starts the rounds of indirect effects.

Multiplier effects: There is an additional 17 cents of indirect sales in the region for every dollar of direct motel sector sales (type I sales multiplier = 1.17). Total secondary sales are 31 cents per dollar of direct sales, which means 17 cents in indirect effects and 14 cents in induced effects.

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An additional 2.9 jobs are created from secondary effects of each million dollars in motel sector sales (13.4 total jobs – 10.5 direct jobs per $million). These jobs are distributed across other sectors of the local economy. Similarly, the secondary effects on income for each dollar of motel sector sales are 8% (33%-25%), and the secondary effects on value added for each dollar of motel sector sales are 18% (73%-55%). Including secondary effects, every million dollars of motel sector sales in the region yields $1.31 million in sales, $330,000 in income, and $730,000 in value added.

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