



Impacts of Visitor Spending on the Local Economy

Sequoia and Kings Canyon National Parks, 2012

Natural Resource Report NPS/NRSS/EQD/NRR—2013/713



ON THE COVER

Campers at Sequoia and Kings Canyon National Parks

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Executive Summary

Sequoia and Kings Canyon National Parks hosted 1,697,617 recreation visits in 2012. Adjustments for visitor group size and re-entries resulted in 403,240 visitor group trips to the parks in 2012. Based on a 2012 Visitor Services Project survey conducted August 2–8, 29% of these visitor group trips were made by local residents or non-locals on day trips that did not include an overnight stay within 80 miles of the parks.¹ Forty-two percent of visitor group trips involved an overnight stay in a lodge, hotel, motel, cabin, B&Bs, etc. outside the parks but within 80 miles of the parks.

Visitors reported their group’s expenditures in the parks and within 80 miles of the parks. The average visitor group size was 3.8 people. Each visitor group spent an average of \$303 in the parks and within 80 miles of the parks.

Total visitor spending in 2012 in the parks and within 80 miles of the parks was \$122.1 million. The greatest proportions of expenditures were for overnight accommodations (39%) and restaurants and bars (15%). Visitors who stayed overnight in a lodge, hotel, motel, cabin, B&B, etc. outside the parks but within 80 miles of the parks accounted for 62% of total spending.

Eighty-four percent of visitor groups indicated the visit to the parks was the primary reason for their trip to the area. Counting only a portion of visitor expenses if visiting the parks was not the primary reason for the trip yields \$111.8 million in spending attributed directly to the parks.

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 Tulare, Fresno, Kings, and Madera counties, California, which roughly coincides with the 80-mile radius from the parks for which expenditures were reported.

Including direct and secondary effects, the \$111.8 million in visitor spending attributed to the parks generated \$151.0 million in direct sales in the region, which supported 1,684 jobs. These jobs paid \$47.2 million in labor income, which was part of \$89.1 million in value added to the region.²

A separate study estimated impacts of park employee payroll on the local economy in FY 2010³, and the results are reported herein. The parks themselves employed 358 people in FY 2010 with a total payroll including benefits of \$21.3 million. Including secondary effects, the local impacts of park payroll in FY 2010 were \$8.5 million in sales, supporting 431 jobs, \$24.0 million in labor income, and \$26.4 million in value added.

Local Economic Impacts of Sequoia and Kings Canyon National Parks

	<u>Sales</u>	<u>Jobs</u>	<u>Labor Income</u>	<u>Value Added</u>
Park Visitor Spending	\$151.0M	1,684	\$47.2M	\$89.1M
Park Payroll	<u>+\$8.5M</u>	<u>+431</u>	<u>+\$24.0M</u>	<u>+\$26.4M</u>
Park Visitor Spending + Payroll	\$159.5M	2,115	\$71.2M	\$115.5M

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).

Acknowledgments

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Introduction

Sequoia and Kings Canyon National Parks, which lie side-by-side in the southern Sierra Nevada in central California, serve as a prime example of nature's size, beauty, and diversity, including the world's largest trees (by volume), grand mountains, rugged foothills, deep canyons, vast caverns, and the highest point in the lower 48 states. Sequoia and Kings Canyon NPs are jointly administered by the National Park Service. Together, the parks cover nearly 866,000 acres in Tulare and Fresno counties, California. In 2012, Sequoia and Kings Canyon NPs (combined) received nearly 1.7 million recreational visits, including 396,757 overnight stays (Table 1).

Table 1. Recreation visits and overnight stays, Sequoia and Kings Canyon NPs, 2012

Month	Recreation visits	Overnight stays			Total
		Lodging	Developed camping*	Wilderness camping	
January	50,842	2,269	789	175	3,233
February	46,899	2,762	808	305	3,875
March	66,789	3,948	755	462	5,165
April	86,938	6,401	3,606	611	10,618
May	159,704	9,115	18,995	1,586	29,696
June	221,514	15,226	47,517	3,790	66,533
July	282,400	15,370	84,908	9,807	110,085
August	352,320	4,253	77,801	11,839	93,893
September	206,248	9,085	33,920	4,534	47,539
October	122,990	6,285	9,961	736	16,982
November	55,793	2,555	2,136	208	4,899
December	45,180	3,552	650	37	4,239
Total	1,697,617	80,821	281,846	34,090	396,757

*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 Sequoia and Kings Canyon NPs 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 Tulare, Fresno, Kings, and Madera counties, California. This four-county region had a population of 1,658,803 (USCB 2012), gross regional product of \$49.7 billion (MIG, Inc. 2008), median household income of \$46,308, and family poverty rate of 18.2% (USCB 2012). State and local governments and support activities for agriculture and forestry were the major employers in the region (MIG, Inc. 2008), and the region experienced a 15.2% unemployment rate in 2012 (BLS 2012).

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 Sequoia and Kings Canyon NPs 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 Sequoia and Kings Canyon NPs from August 2–8, 2012.⁴ The VSP survey measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a systematic, random sample of 1,019 visitor groups. Visitors returned 541 questionnaires resulting in a response rate of 53.1%.

Spending and economic impact estimates for Sequoia and Kings Canyon NPs are based in part on the 2012 VSP survey data. Visitors were asked to report expenditures inside the parks and within 80 miles of the parks. The local region for determining economic impact was defined as Tulare, Fresno, Kings, and Madera counties, California.

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

Local: Visitors that were residents of the local region, i.e., within 80 miles of the parks.

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 parks.⁵

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

Motel-out: Visitors who reported motel expenses outside the parks, but within 80 miles of the parks.

Camp-out: Visitors who reported camping expenses outside the parks, but within 80 miles of the parks.

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.

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 parks' NPS Public Use Statistics (2012) overnight stay figures.

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, 8% of park entries were classified as day visits by residents of the local region and 14% were day visits by people from outside the local region (Table 2). The remaining 78% were classified as overnight visits including an overnight stay in the local region. The average visitor group size ranged from 2.6 to 4.6 people across the seven segments with an average visitor group of 3.8 people.⁷ The average length of stay in the local region on overnight trips was 2.9 nights. Eighty-four percent of visitor groups indicated that visiting the parks was the primary reason for their trip to the area.

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

Characteristic	Segment							All visitors
	Local	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	
Visitor segment share (park entries)	8%	14%	4%	6%	46%	6%	16%	100%
Average visitor group size	2.6	3.4	3.4	4.6	3.4	3.5	3.9	3.8
Length of stay (days or nights)	1.0	1.0	2.3	3.8	1.9	3.3	3.4	2.9
Re-entry rate (park entries per trip)	1.0	1.0	1.2	1.2	1.4	1.1	1.2	1.2
Percent primary purpose trips	100%	68%	93%	93%	81%	73%	69%	84%

The 1,697,617 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 parks during their stay and the average visitor group size. The 1,697,617 recreation visits represented 403,240 visitor group trips (Table 3).

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

Measure	Segment							All visitors
	Local	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	
Recreation visits	135,809	237,666	67,905	101,857	780,904	101,857	271,619	1,697,617
Visitor group trips	50,308	67,311	17,265	17,920	167,600	25,838	56,999	403,240
Percent of visitor group trips*	12%	17%	4%	4%	42%	6%	14%	100%

*Segment percentages do not sum to 100% due to rounding.

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 parks and within 80 miles of the parks.⁸ Spending averages were computed on a visitor group trip basis for each segment. The average visitor group spent \$303 on the trip, including expenditures inside the parks and within 80 miles of the parks (Table 4). On a visitor group trip basis, average spending was \$48 for day trips by local residents and \$87 for day trips by non-local visitors. Visitor groups staying in motels in the parks spent an average of \$724 on their trips, while those staying in motels outside the parks spent \$449. Those camping inside the parks spent an average of \$354 on their trips, while those camping outside the parks spent \$381. Visitor groups spent approximately 72% of their total spending outside the parks.

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

Expenditures	Segment							All visitors*
	Local	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	
Inside Parks								
Motel	0.00	0.00	378.38	0.00	0.65	0.00	0.00	16.47
Camping fees	0.00	0.00	0.85	85.56	3.20	12.97	0.00	6.00
Restaurants & bars	1.08	12.75	102.53	17.17	10.56	15.41	8.10	13.94
Groceries & takeout food	0.76	3.25	25.49	56.34	5.57	7.54	8.17	8.18
Local transportation	0.00	14.07	30.96	8.37	0.20	8.11	17.67	7.15
Admission & fees	17.68	12.75	26.48	22.78	16.26	15.81	10.09	15.68
<u>Souvenirs & other expenses</u>	<u>2.70</u>	<u>17.55</u>	<u>22.48</u>	<u>32.75</u>	<u>14.67</u>	<u>49.08</u>	<u>12.33</u>	<u>16.67</u>
Total Inside Parks	22.22	60.36	587.16	222.97	51.09	108.92	56.36	84.08
Outside Parks								
Motel	0.00	0.00	53.70	0.00	209.41	0.00	0.00	89.34
Camping fees	0.00	0.00	0.00	0.00	0.12	88.54	0.00	5.72
Restaurants & bars	0.76	2.98	23.79	10.47	59.94	36.89	8.09	30.50
Groceries & takeout food	3.19	4.24	9.23	40.65	20.90	60.51	15.98	18.13
Gas & oil	19.57	18.05	29.82	48.77	51.52	72.16	29.85	39.16
Local transportation	0.00	0.00	19.34	19.09	31.24	0.00	39.61	20.26
Admission & fees	2.70	0.00	0.00	0.99	12.73	4.86	1.27	6.16
<u>Souvenirs & other expenses</u>	<u>0.00</u>	<u>1.16</u>	<u>0.88</u>	<u>10.59</u>	<u>12.23</u>	<u>8.92</u>	<u>22.60</u>	<u>9.55</u>
Total Outside Parks	26.22	26.42	136.76	130.58	398.09	271.89	117.41	218.82
Total Inside & Outside Parks	48.43	86.79	723.92	353.55	449.19	380.81	173.77	302.90

*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 9%.⁹ A 95% confidence interval for the overall visitor group spending average was therefore \$303 plus or minus \$29 or between \$274 and \$332.

On a per night basis, visitor groups staying in motels in the parks spent \$315 in the local region, while visitor groups staying in motels outside the parks spent \$241 per night (Table 5). The average reported per-night lodging expense was \$188 for motels inside the parks and \$113 for motels outside the parks.

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

Expenditures	Segment				
	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN
Motel	188.16	0.00	112.72	0.00	0.00
Camping fees	0.37	22.58	1.78	31.23	0.00
Restaurants & bars	55.01	7.29	37.83	16.09	4.78
Groceries & takeout food	15.12	25.59	14.20	20.94	7.13
Gas & oil	12.99	12.87	27.65	22.20	8.81
Local transportation	21.90	7.25	16.87	2.49	16.90
Admission & fees	11.53	6.27	15.56	6.36	3.35
<u>Souvenirs & other expenses</u>	<u>10.17</u>	<u>11.44</u>	<u>14.43</u>	<u>17.85</u>	<u>10.31</u>
Total per visitor group per night	315.26	93.29	241.03	117.17	51.28

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. Sequoia and Kings Canyon NPs visitors spent a total of \$122.1 million in the local region in 2012 (Table 6). Visitors who stayed in motels outside the parks accounted for 62% of the total spending. Motel expenses represented 35% of total spending (Figure 1).

⁹ Relative standard error is the standard error divided by the mean and expressed as a percentage. Standard error is a measure of the variability in the sampling distribution of the mean. A low standard error indicates there is relatively less spread in the sampling distribution, and that the sample mean is more likely an accurate estimate of the population mean. Most relative standard error estimates for visitor spending in parks using VSP data are between 10% and 20%. A 9% relative standard error for Sequoia and Kings Canyon is low, indicating that the sample mean is a good approximation of the population mean.

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

Expenditures	Segment							All visitors
	Local	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	
Inside Parks								
Motel	0	0	6,533	0	108	0	0	6,641
Camping fees	0	0	15	1,533	536	335	0	2,419
Restaurants & bars	54	858	1,770	308	1,770	398	462	5,620
Groceries & takeout food	38	218	440	1,010	933	195	466	3,300
Local transportation	0	947	534	150	33	209	1,007	2,881
Admission & fees	889	858	457	408	2,725	409	575	6,322
<u>Souvenirs & other expenses</u>	<u>136</u>	<u>1,181</u>	<u>388</u>	<u>587</u>	<u>2,458</u>	<u>1,268</u>	<u>703</u>	<u>6,721</u>
Total Inside Parks	1,118	4,063	10,138	3,996	8,563	2,814	3,213	33,904
Outside Parks								
Motel	0	0	927	0	35,098	0	0	36,025
Camping fees	0	0	0	0	20	2,288	0	2,307
Restaurants & bars	38	201	411	188	10,046	953	461	12,297
Groceries & takeout food	160	285	159	728	3,503	1,564	911	7,311
Gas & oil	984	1,215	515	874	8,635	1,864	1,702	15,789
Local transportation	0	0	334	342	5,236	0	2,258	8,170
Admission & fees	136	0	0	18	2,134	126	73	2,486
<u>Souvenirs & other expenses</u>	<u>0</u>	<u>78</u>	<u>15</u>	<u>190</u>	<u>2,049</u>	<u>230</u>	<u>1,288</u>	<u>3,851</u>
Total Outside Parks	1,319	1,779	2,361	2,340	66,720	7,025	6,692	88,236
Total Inside & Outside Parks	2,437	5,842	12,499	6,335	75,284	9,839	9,905	122,140
Segment Percent of Total	2%	5%	10%	5%	62%	8%	8%	100%

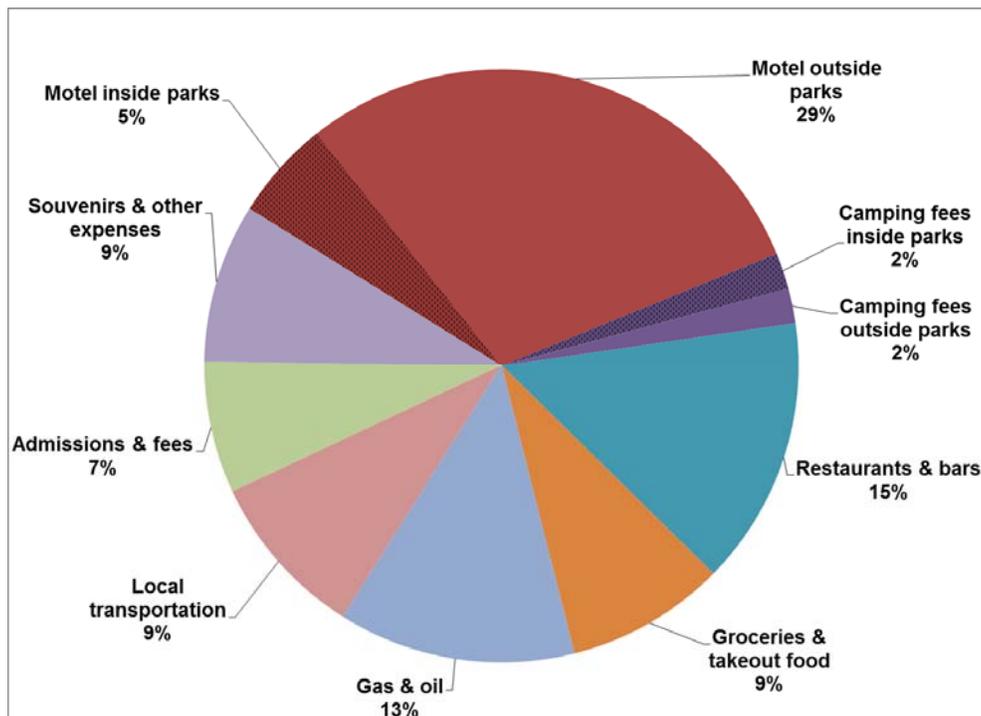


Figure 1. Sequoia and Kings Canyon NPs visitor spending by category

Because visitors would come to the region whether or not the parks existed, not all visitor spending can be attributed to the parks. Sixteen percent of visitor groups surveyed did not make the trip primarily to visit Sequoia and Kings Canyon NPs. Spending directly attributed to park visits was estimated by counting all spending on trips for which the parks were the primary reason for the trip. If the parks were 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 \$111.8 million in visitor spending was attributed to the parks visits (Table 7). This represented 91% of the overall visitor spending total.

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

Expenditures	Segment							All visitors
	Local	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	
Motel	0	0	7,421	0	32,156	0	0	39,578
Camping fees	0	0	15	1,533	554	2,191	0	4,293
Restaurants & bars	54	1,026	2,164	486	10,943	1,171	823	16,668
Groceries & takeout food	38	458	593	1,701	4,132	1,463	1,180	9,565
Gas & oil	0	1,020	493	830	7,885	1,512	1,335	13,075
Local transportation	0	947	854	475	4,814	209	2,779	10,079
Admission & fees	889	858	457	425	4,673	510	632	8,446
<u>Souvenirs & other expenses</u>	<u>136</u>	<u>1,247</u>	<u>403</u>	<u>767</u>	<u>4,329</u>	<u>1,455</u>	<u>1,714</u>	<u>10,050</u>
Total Attributed to Parks	1,118	5,556	12,400	6,217	69,486	8,513	8,463	111,753
Percent of Spending Attributed to the Parks	46%	95%	99%	98%	92%	87%	85%	91%
Percent of Attributed Spending	1%	5%	11%	6%	62%	8%	8%	100%

Economic Impacts of Visitor Spending

The economic impacts of Sequoia and Kings Canyon NPs 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 Tulare, Fresno, Kings, and Madera counties, California.¹⁰ 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.¹¹ 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,

¹⁰ 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.

¹¹ See Appendix C: Economic Ratios and Multipliers for the region.

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.

The tourism output sales multiplier for the region is 1.64. Every dollar of direct sales to visitors generated another \$0.64 in secondary sales through indirect and induced effects.¹² (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 parks. 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 parks—shows the impact or contribution the parks make to the economy of the local region.

Impacts of All Visitor Spending

Using all visitor spending and including direct and secondary effects, the \$122.1 million spent by park visitors generated \$163.4 million in sales, which supported 1,817 jobs in the local region (Table 8). These jobs paid \$51.2 million in labor income, which was part of \$96.5 million in value added to the region.¹³

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	42,666	430	9,409	23,112
Camping fees	4,727	57	1,725	2,335
Restaurants & bars	17,917	318	5,730	9,583
Groceries & takeout food	8,807	148	2,733	5,473
Gas & oil	11,051	209	6,001	8,713
Local transportation	2,685	41	1,321	1,945
Admission & fees	3,521	21	1,645	2,558
Souvenirs & other expenses	5,286	92	2,469	3,988
Wholesale trade	1,841	11	725	1,400
<u>Local production of goods</u>	<u>1,176</u>	<u>4</u>	<u>239</u>	<u>412</u>
Total Direct Effects	99,676	1,331	31,997	59,521
<u>Secondary Effects</u>	<u>63,706</u>	<u>486</u>	<u>19,211</u>	<u>36,956</u>
Total Effects	163,382	1,817	51,208	96,476

Note: Impacts of \$122.1 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

¹² 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.

¹³ Jobs includes full-time 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.

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.

Impacts of Visitor Spending Attributed to the Parks

Using only visitor spending attributable to the parks by including only some spending on trips where the primary trip purpose was not to visit Sequoia and Kings Canyon NPs reduced the overall impacts by about 8% (Table 9; see spending inclusion assumptions in previous section). Including direct and secondary effects, the \$111.8 million spent by park visitors and attributable to the parks generated \$151.0 million in sales, which supported 1,684 jobs in the local region. These jobs paid \$47.2 million in labor income, which was part of \$89.1 million in value added to the region.

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

Sector/Expenditure category	Sales (thousands of dollars)	Jobs	Labor Income (thousands of dollars)	Value Added (thousands of dollars)
Direct Effects				
Motels	39,578	399	8,728	21,439
Camping fees	4,293	52	1,567	2,121
Restaurants & bars	16,668	296	5,330	8,915
Groceries & takeout food	8,446	142	2,621	5,249
Gas & oil	10,079	191	5,473	7,946
Local transportation	2,420	37	1,190	1,754
Admission & fees	2,916	17	1,362	2,118
Souvenirs & other expenses	5,025	87	2,347	3,791
Wholesale trade	1,642	10	647	1,249
<u>Local production of goods</u>	<u>1,075</u>	<u>4</u>	<u>222</u>	<u>383</u>
Total Direct Effects	92,140	1,234	29,488	54,964
<u>Secondary Effects</u>	<u>58,877</u>	<u>449</u>	<u>17,752</u>	<u>34,152</u>
Total Effects	151,017	1,684	47,240	89,117

Note: Impacts of \$111.8 million in visitor spending attributed to the parks 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 the 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. Sequoia and Kings Canyon NPs employed 358 people in FY 2010 with a total payroll including benefits of \$21.3 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were \$8.5 million in sales, 431 jobs, \$24.0 million in labor income, and \$26.4 million value added (Stynes 2011).

Combined Economic Impacts

The combined impacts to the region of visitor spending attributable to the parks and NPS payroll were \$159.5 million in sales, which supported 2,115 jobs with labor income of \$71.2 million, which was part of a total value added of \$115.5 million.

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 parks, 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 parks.

Spending averages outside the parks were derived from the 2012 Sequoia and Kings Canyon NPs 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 9%.

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 of more than 18 people (2 cases), visiting the local region for more than 14 nights (1 case), or spending more than \$2,004 (the mean plus two times the standard deviation of the mean for spending, 13 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 in August. To extrapolate to annual totals, it was assumed that the amount spent by visitor groups in this sample is representative of the amount spent by visitor groups 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 parks when the parks were not the primary reason for the trip is somewhat subjective. Because 16% of visitors to Sequoia and Kings Canyon NPs did not make the trip primarily to visit the parks and 72% of all spending occurred outside the parks, adjustments for non-primary purpose trips have an 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: <ul style="list-style-type: none"> • 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 full-time 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.

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. <ul style="list-style-type: none"> • 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.

Appendix B: Expenditure Sector Assignments

Table B1 shows expenditure categories visitors were asked to estimate in the Sequoia and Kings Canyon NPs VSP questionnaire. Some expenditure categories were combined and renamed for MGM2 analysis.

Table B1. Expenditure categories in Sequoia and Kings Canyon NPs questionnaire and MGM2 sector assignment

Questionnaire expenditure categories	Inside parks	Outside parks	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	Gas & oil
Other transportation expenses (rental cars, taxis, auto repairs, shuttle, 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

MGM2 sector	IMPLAN		2007 NAICS
	No.	Name	
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).

Appendix C: Economic Ratios and Multipliers

Table C1. Economic ratios and multipliers for selected tourism-related sectors, Sequoia and Kings Canyon NPs region, 2012

Sector	Direct effects				Total effects multipliers			
	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	9.66	0.22	0.54	1.38	1.66	14.78	0.44	0.94
Camping fees	11.54	0.36	0.49	1.42	1.82	18.03	0.64	1.01
Restaurants & bars	16.85	0.32	0.53	1.32	1.64	21.31	0.51	0.91
Groceries & takeout food	14.28	0.49	0.72	1.23	1.67	19.43	0.70	1.15
Gas & oil	4.48	0.47	0.73	1.23	1.65	9.45	0.67	1.13
Local transportation	16.86	0.54	0.79	1.10	1.56	21.26	0.73	1.13
Admission & fees	16.33	0.31	0.62	1.28	1.59	20.92	0.49	0.99
Souvenirs & other expenses	16.47	0.47	0.75	1.21	1.62	21.24	0.66	1.14
Local production of goods	2.73	0.19	0.36	1.22	1.42	5.60	0.32	0.60
Wholesale trade	5.87	0.39	0.76	1.17	1.53	10.05	0.57	1.09

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 9.7 jobs in the motel sector. Fifty-four percent of motel sector sales are value added, including 22% that goes to wages and salaries of motel employees. That means 46% 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 46% of sales spent on purchases by motels starts the rounds of indirect effects.

Multiplier effects: There is an additional 38 cents of indirect sales in the region for every dollar of direct motel sector sales (type I sales multiplier = 1.38). Total secondary sales are 66 cents per dollar of direct sales, which means 38 cents in indirect effects and 28 cents in induced effects.

An additional 5.1 jobs are created from secondary effects of each million dollars in motel sector sales (14.8 total jobs – 9.7 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 22% (44%-22%), and the secondary effects on value added for each dollar of motel sector sales are 40% (94%-54%). Including secondary effects, every million dollars of motel sector sales in the region yields \$1.66 million in sales, \$440,000 in income, and \$940,000 in value added.

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