



Impacts of Visitor Spending on the Local Economy

Chickasaw National Recreation Area, 2012

Natural Resource Report NPS/NRSS/EQD/NRR—2013/666



ON THE COVER

Travertine Creek at Chickasaw National Recreation Area
Photograph by Park Studies Unit staff

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Executive Summary

Chickasaw National Recreation Area hosted 1,656,240 recreation visits in 2012. Adjustments for visitor group size and re-entries resulted in 315,174 visitor group trips to the park in 2012. Based on a 2012 Visitor Services Project survey conducted June 12–18, 83% 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 Four percent of visitor group trips involved an overnight stay in a lodge, hotel, motel, cabin, B&Bs, etc. in the local area, and 3% were overnight camping stays either in the park or local area.

Visitors reported their group's expenditures in the park and within 50 miles of the park. The average visitor group size was 4.1 people, and they spent an average of \$70.50 in the park and local area.

Total visitor spending in 2012 in the park and within 50 miles of the park was \$22.2 million. The greatest proportions of expenditures were for gas and oil (34%) and groceries and takeout food (24%). Local residents accounted for 36% of total spending.

Seventy-four 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 \$12.4 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 a fourteen-county region including Murray, Carter, Johnston, Pontotoc, Garvin, Atoka, Bryan, Coal, Hughes, Love, Marshall, McClain, Pottawatomie, and Seminole counties, Oklahoma. This region roughly coincides with the 50-mile radius around the park for which expenditures were reported.

Including direct and secondary effects, the \$12.4 million in visitor spending attributed to the park generated \$11.3 million in direct sales in the region, which supported 172 jobs. These jobs paid \$3.5 million in labor income, which was part of \$6.3 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 The park itself employed 76 people with a total payroll including benefits of \$3.8 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were \$1.4 million in sales, supporting 91 jobs, \$4.2 million in labor income, and \$4.6 million in value added.

Local Economic Impacts of Chickasaw National Recreation Area

	<u>Sales</u>	<u>Jobs</u>	<u>Labor Income</u>	<u>Value Added</u>
Park Visitor Spending	\$11.3M	172	\$3.5M	\$6.3M
Park Payroll	<u>+\$1.4M</u>	<u>+ 91</u>	<u>+ \$4.2M</u>	<u>+ \$4.6M</u>
Park Visitor Spending + Payroll	\$12.7M	263	\$7.7M	\$10.9M

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

Chickasaw National Recreation Area (NRA) encompasses the former Platt National Park established in 1906 and Lake of the Arbuckles built in 1966 by the Bureau of Reclamation. The park is located in south-central Oklahoma near the town of Sulphur in Murray County. Chickasaw NRA received 1,656,240 recreation visits in 2012 including 72,363 overnight stays (Table 1).

Table 1. Recreation visits and overnight stays, Chickasaw NRA, 2012

Month	Recreation visits	Overnight (OVN) stays		
		Tent and RV campers	Group campers	Total OVN stays
January	51,944	180	0	180
February	66,029	296	139	435
March	121,594	5,197	1,548	6,745
April	99,136	2,698	1,452	4,150
May	165,133	9,696	3,056	12,752
June	196,902	11,520	3,388	14,908
July	175,871	10,601	1,796	12,397
August	112,416	4,570	2,938	7,508
September	129,252	4,040	980	5,020
October	281,963	3,180	2,328	5,508
November	195,217	1,507	1,136	2,643
<u>December</u>	<u>60,783</u>	<u>117</u>	<u>0</u>	<u>117</u>
Total	1,656,240	53,602	18,761	72,363

Source: NPS Public Use Statistics 2012.

The purpose of this study is to estimate the annual, local economic impacts of visitors to Chickasaw NRA 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.) A separate study previously 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 Murray, Carter, Johnston, Pontotoc, Garvin, Atoka, Bryan, Coal, Hughes, Love, Marshall, McClain, Pottawatomie, and Seminole counties, Oklahoma. This fourteen-county region had a population of 368,289 (USCB 2012), gross regional product of \$10.5 billion (MIG, Inc. 2008), median household income of \$39,857, and family poverty rate of 13.6% (USCB 2011). State and local governments, including education, were the major employers in the region (MIG, Inc. 2008), and the region experienced a 4.7% 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 Chickasaw NRA 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 Chickasaw NRA from June 12–18, 2012.⁴ The VSP survey measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a systematic, random sample of 687 visitor groups. Visitors returned 279 questionnaires resulting in a response rate of 40.6%.

Spending and economic impact estimates for Chickasaw NRA 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 a fourteen-county area around the park including Murray, Carter, Johnston, Pontotoc, Garvin, Atoka, Bryan, Coal, Hughes, Love, Marshall, McClain, Pottawatomie, and Seminole counties, Oklahoma, which roughly coincided with the 50-mile radius for which visitor spending was reported.

The MGM2 model divides visitors into segments to help explain differences in spending across distinct user groups. Five segments were established for Chickasaw NRA 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.

Camping: Visitors who reported camping expenses inside the park or in the local region.⁵

Motel: Visitors who reported motel expenses in the local region.⁶

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 Only four respondents reported camping expenses in the local region outside the park. Due to the small sample size, these cases were assigned to the same segment as respondents reporting camping expenses inside the park.

⁶ 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.⁷

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.

⁷ 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, 70% of park entries were classified as day visits by either residents or visitors from outside the region, and the remaining 30% were classified as overnight visits including an overnight stay in the local region (Table 2). The average visitor group size ranged from 3.7 to 4.8 people across the five segments with an average visitor group of 4.1 people.⁸ The average length of stay in the local region on overnight trips was 2.2 nights. Seventy-four 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

Characteristic	Segment					All visitors
	Local	Day trip	Camping	Motel	Other OVN	
Visitor segment share (park entries)	40%	30%	6%	5%	19%	100%
Average visitor group size	3.7	3.8	4.8	3.9	4.4	4.1
Length of stay (days or nights)	1.0	1.0	2.4	1.5	2.3	2.2
Re-entry rate (park entries per trip)	1.2	1.2	2.2	1.6	2.3	1.5
Percent primary purpose trips	100%	55%	86%	57%	40%	74%

The 1,656,240 recreation visits in 2012 were allocated to the five 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 1,656,240 recreation visits represented 315,174 visitor group trips (Table 3).

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

Measure	Segment					All visitors
	Local	Day trip	Camping	Motel	Other OVN	
Recreation visits	662,496	496,872	99,374	82,812	314,686	1,656,240
Visitor group trips	151,957	109,188	9,571	12,867	31,592	315,174
Percent of visitor group trips	48%	35%	3%	4%	10%	100%

⁸ 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.⁹ Spending averages were computed on a visitor group trip basis for each segment. The average visitor group spent \$70.50 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 \$52.94 for day trips by local residents and \$39.97 for day trips by non-local visitors. Visitor groups staying in motels spent an average of \$484.43 on their trips, and those camping spent an average of \$156.73 on their trips. Visitor groups spent about 90% of their total spending outside the park.

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

Expenditures	Segment					All visitors [*]
	Local	Day trip	Camping	Motel	Other OVN	
Inside Park						
Camping fees	0.00	0.00	44.57	0.00	0.00	1.35
Restaurants & bars	0.92	1.50	2.40	19.67	0.00	1.84
Groceries	1.66	0.00	11.44	13.11	1.34	1.82
Admission & fees	1.51	0.95	1.58	1.97	0.78	1.27
<u>Souvenirs & other expenses</u>	<u>0.14</u>	<u>1.19</u>	<u>3.25</u>	<u>3.03</u>	<u>0.00</u>	<u>0.70</u>
Total Inside Park	4.24	3.65	63.24	37.79	2.12	6.98
Outside Park						
Motels	0.00	0.00	0.00	259.84	0.00	10.61
Camping fees	0.00	0.00	2.64	0.00	0.00	0.08
Restaurants & bars	6.31	12.08	10.54	52.46	7.97	10.49
Groceries & takeout food	15.21	5.97	42.10	45.49	26.80	15.22
Gas & oil	25.79	17.22	30.20	67.62	21.23	24.21
Local transportation	0.00	0.00	2.06	0.00	0.00	0.06
Admission & fees	0.65	0.50	0.60	3.61	3.86	1.04
<u>Souvenirs & other expenses</u>	<u>0.74</u>	<u>0.55</u>	<u>5.35</u>	<u>17.62</u>	<u>3.83</u>	<u>1.81</u>
Total Outside Park	48.70	36.33	93.50	446.64	63.70	63.52
Total Inside & Outside Park	52.94	39.97	156.73	484.43	65.82	70.50

^{*}Weighted by percent visitor group trips.

The relative standard error at a 95% confidence level for the overall spending average was 20%. A 95% confidence interval for the overall visitor group spending average was therefore \$70.50 plus or minus \$14.22 or between \$56.28 and \$84.72.

On a per night basis, visitor groups staying in motels spent \$322.95 in the local region, and campers spent \$66.61 (Table 5). The average reported per-night lodging expense was \$173.22 for motels and \$20.06 for camping fees.

⁹ Some expenditure categories in the VSP questionnaire were combined for reporting herein and MGM2 analysis. See Appendix B.

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

Expenditures	Segment		
	Camping	Motel	Other OVN
Motels	0.00	173.22	0.00
Camping fees	20.06	0.00	0.00
Restaurants & bars	5.50	48.09	3.46
Groceries & takeout food	22.75	39.07	12.23
Gas & oil	12.84	45.08	9.23
Local transportation	0.87	0.00	0.00
Admission & fees	0.93	3.72	2.02
<u>Souvenirs & other expenses</u>	<u>3.66</u>	<u>13.77</u>	<u>1.67</u>
Total per visitor group per night	66.61	322.95	28.62

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. Chickasaw NRA visitors spent a total of \$22.2 million in the local region in 2012 (Table 6). Local residents accounted for 36% of the total spending, and visitors who stayed in motels accounted for 28%. Gas and oil expenses represented 34% of total spending and groceries and takeout food expenses represented 24% (Figure 1).

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

Expenditures	Segment					All visitors
	Local	Day trip	Camping	Motel	Other OVN	
Inside Park						
Camping fees	0	0	427	0	0	427
Restaurants & bars	140	164	23	253	0	580
Groceries & takeout food	252	0	109	169	42	573
Admission & fees	230	104	15	25	25	399
<u>Souvenirs & other expenses</u>	<u>21</u>	<u>130</u>	<u>31</u>	<u>39</u>	<u>0</u>	<u>221</u>
Total Inside Park	644	398	605	486	67	2,200
Outside Park						
Motels	0	0	0	3,343	0	3,343
Camping fees	0	0	25	0	0	25
Restaurants & bars	959	1,318	101	675	252	3,305
Groceries & takeout food	2,311	652	403	585	847	4,798
Gas & oil	3,920	1,881	289	870	671	7,630
Local transportation	0	0	20	0	0	20
Admission & fees	98	55	6	46	122	327
<u>Souvenirs & other expenses</u>	<u>112</u>	<u>60</u>	<u>51</u>	<u>227</u>	<u>121</u>	<u>571</u>
Total Outside Park	7,400	3,966	895	5,747	2,012	20,020
Total Inside & Outside Park	8,044	4,364	1,500	6,233	2,079	22,220
Segment Percent of Total	36%	20%	7%	28%	9%	100%

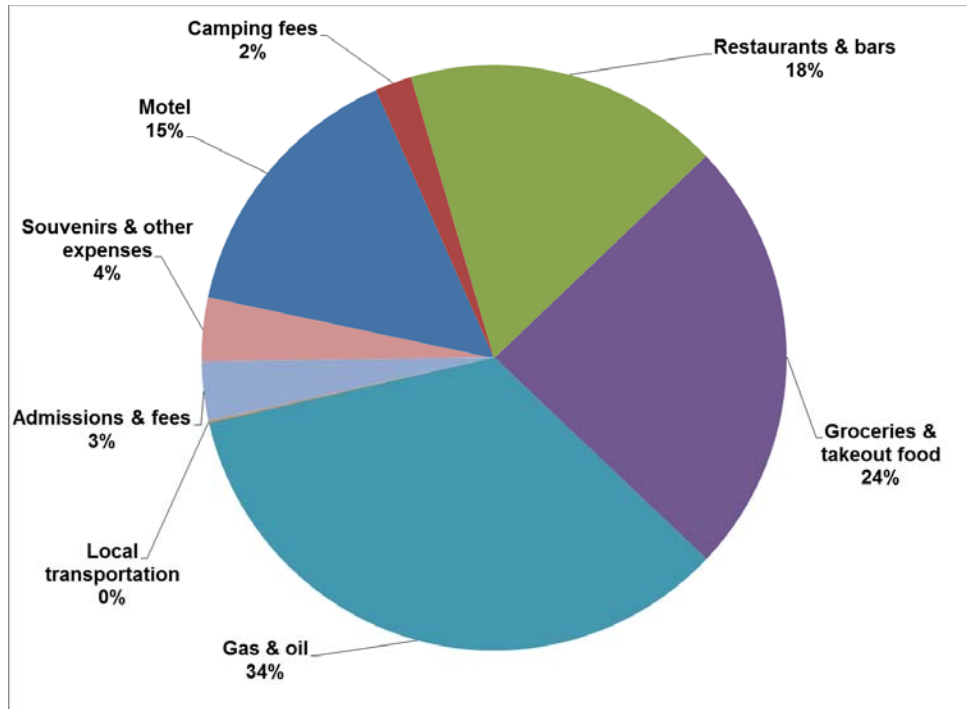


Figure 1. Chickasaw NRA visitor spending by category

Because visitors would come to the region whether or not the park existed, not all visitor spending can be attributed to the park. Twenty-six percent of visitor groups did not make the trip primarily to visit Chickasaw NRA. 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 \$12.4 million in visitor spending was attributed to the park visit (Table 7). This represented 56% 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	Camping	Motel	Other OVN	
Motels	0	0	0	2,866	0	2,866
Camping fees	0	0	450	0	0	450
Restaurants & bars	140	1,188	116	832	166	2,442
Groceries & takeout food	252	506	479	670	602	2,510
Gas & oil	0	1,460	265	746	443	2,914
Local transportation	0	0	18	0	0	18
Admission & fees	230	146	20	65	105	567
Souvenirs & other expenses	21	177	78	233	80	589
Total Attributed to Park	644	3,477	1,427	5,412	1,397	12,356
Percent of Spending Attributed to the Park	8%	80%	95%	87%	67%	56%
Percent of Attributed Spending	5%	28%	12%	44%	11%	100%

Economic Impacts of Visitor Spending

The economic impacts of Chickasaw NRA 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 the fourteen-county region—Murray, Carter, Johnston, Pontotoc, Garvin, Atoka, Bryan, Coal, Hughes, Love, Marshall, McClain, Pottawatomie, and Seminole counties in Oklahoma.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, 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 1.38. Every dollar of direct sales to visitors generated another \$0.38 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 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 \$22.2 million spent by park visitors generated \$17.2 million in sales, which supported 261 jobs in the local region (Table 8). These jobs paid \$5.5 million in labor income, which was part of \$9.8 million in value added to the region.¹³

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.

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 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.

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	3,343	50	842	1,713
Camping fees	452	6	145	200
Restaurants & bars	3,885	77	1,296	2,033
Groceries & takeout food	1,359	26	663	980
Gas & oil	1,702	27	627	1,154
Local transportation	20	1	11	14
Admission & fees	726	16	216	430
Souvenirs & other expenses	396	7	200	306
Wholesale trade	512	4	191	385
<u>Local production of goods¹⁴</u>	<u>68</u>	<u>0</u>	<u>3</u>	<u>25</u>
Total Direct Effects	12,463	215	4,194	7,241
<u>Secondary Effects</u>	<u>4,688</u>	<u>47</u>	<u>1,347</u>	<u>2,580</u>
Total Effects	17,151	261	5,541	9,821

Note: Impacts of \$22.2 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 restaurants & bars and motels.

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 Chickasaw NRA reduced the overall impacts by about 34% (Table 9; see spending inclusion assumptions in previous section). Including direct and secondary effects, the \$12.4 million spent by park visitors and attributable to the park generated \$11.3 million in sales, which supported 172 jobs in the local region. These jobs paid \$3.5 million in labor income, which was part of \$6.3 million in value added to the region.

¹⁴ Although the impacts for “local production of goods” may appear low compared to visitor spending for the categories grocery & takeout food, gas & oil, and souvenirs & other expenses, they reflect the retail and wholesale margins in MGM2 described on the previous page (p. 9, paragraph 2). In addition, the regional purchase coefficients—the proportions of local demand supplied by local producers—for the manufacturing sectors associated with those expenditure categories are low, ranging from 1.1 to 2.8 percent. In other words, most of the dollars spent locally by visitors on retail items are not spent on items made locally.

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	2,866	43	722	1,468
Camping fees	450	6	144	199
Restaurants & bars	2,442	48	814	1,278
Groceries & takeout food	635	12	310	458
Gas & oil	650	10	239	441
Local transportation	18	1	10	13
Admission & fees	567	13	169	336
Souvenirs & other expenses	295	6	149	227
Wholesale trade	229	2	85	172
<u>Local production of goods¹⁵</u>	<u>29</u>	<u>0</u>	<u>2</u>	<u>11</u>
Total Direct Effects	8,179	141	2,644	4,603
<u>Secondary Effects</u>	<u>3,108</u>	<u>31</u>	<u>895</u>	<u>1,708</u>
Total Effects	11,287	172	3,540	6,311

Note: Impacts of \$12.4 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. For FY 2010, a separate study estimated the impacts of park payroll by applying economic multipliers to wage and salary data to capture the induced effects of NPS employee spending on local economies (Stynes 2011). Chickasaw NRA itself employed 76 people in FY 2010 with a total payroll including benefits of \$3.8 million.¹⁶ Including secondary effects, the local impacts of the park payroll in FY 2010 were \$1.4 million in sales, 91 jobs, \$4.2 million in labor income, and \$4.6 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 \$12.7 million in sales, which supported 263 jobs with labor income of \$7.7 million, which was part of a total value added of \$10.9 million.

¹⁵ See footnote 14.

¹⁶ Stynes (2011) described his method for estimating park employment as follows: “The number of employees for each park was estimated by totaling the number of distinct social security numbers in each pay period and dividing by the number of pay periods. The figure is therefore an annual average. Four seasonal jobs for three months count as one job. No distinction is made between part-time and full-time employees. Jobs, salary, and payroll benefits are assigned to the park where the employee’s time was charged, which may differ from their duty station” (p. 11).

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 based on visitor responses to a VSP survey question about the number of entries they made into the park.

Spending averages outside the park were derived from the 2012 Chickasaw NRA 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 20%.

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 10 people (14 cases), visiting the local region for more than 12 nights (4 cases), or spending greater than \$1,050 (the mean plus two times the standard deviation of the mean for spending, 8 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 a week in June. 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 26% of visitors to Chickasaw NRA did not make the trip primarily to visit the park and all spending occurs 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: <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 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.

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 Chickasaw NRA VSP questionnaire. Some expenditure categories were combined and renamed for MGM2 analysis.

Table B1. Expenditure categories in Chickasaw NRA questionnaire and MGM2 sector assignment

Questionnaire expenditure categories	Inside park	Outside park	MGM2 sector
Lodge, hotel, motel, cabin, B&B, etc.		X	Motels
Camping fees and charges	X	X	Camping fees
Guide fees and charges		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, but NOT airfare)		X	Local transportation
Boat, kayak, canoe rental & launch fees	X	X	Admissions & fees
Admission, recreation, entertainment fees	X	X	Admissions & fees
All other expenditures (souvenirs, books, post cards, 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, Chickasaw NRA region, 2011

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	14.38	0.25	0.51	1.23	1.40	18.37	0.37	0.74
Camping fees	13.50	0.32	0.44	1.27	1.49	18.54	0.48	0.73
Restaurants & bars	18.83	0.33	0.52	1.15	1.35	22.22	0.44	0.73
Groceries & takeout food	17.54	0.49	0.72	1.14	1.41	21.64	0.61	0.96
Gas & oil	12.15	0.37	0.68	1.16	1.38	15.90	0.48	0.90
Local transportation	30.57	0.56	0.74	1.08	1.39	34.47	0.68	0.96
Admission & fees	21.74	0.30	0.59	1.16	1.34	25.24	0.40	0.79
Souvenirs & other expenses	17.74	0.51	0.77	1.11	1.39	21.63	0.62	1.00
Local production of goods	3.96	0.13	0.38	1.09	1.16	5.43	0.17	0.46
Wholesale trade	7.87	0.37	0.75	1.11	1.32	11.12	0.47	0.94

Source: IMPLAN (MIG, Inc. 2008), 2010 county data 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 14.4 jobs in the motel sector. Fifty-one percent of motel sector sales are value added, including 25% that goes to wages and salaries of motel employees. That means 49% 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 49% of sales spent on purchases by motels starts the rounds of indirect effects.

Multiplier effects: There is an additional 23 cents of indirect sales in the region for every dollar of direct motel sector sales (type I sales multiplier = 1.23). Total secondary sales are 40 cents per dollar of direct sales, which means 23 cents in indirect effects and 17 cents in induced effects.

An additional 4.0 jobs are created from secondary effects of each million dollars in motel sector sales (18.4 total jobs – 14.4 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 12% (37%-25%), and the secondary effects on value added for each dollar of motel sector sales are 23% (74%-51%). Including secondary effects, every million dollars of motel sector sales in the region yields \$1.40 million in sales, \$370,000 in income, and \$740,000 in value added.

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