



Impacts of Visitor Spending on the Local Economy

Big South Fork National River and Recreation Area, 2012

Natural Resource Report NPS/NRSS/EQD/NRR—2013/685



ON THE COVER

Big South Fork National River and Recreation Area
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Executive Summary

Big South Fork National River and Recreation Area hosted 600,161 recreation visits in 2012. Adjustments for visitor group size and re-entries resulted in 195,694 visitor group trips to the park in 2012. Based on a 2012 Visitor Services Project survey conducted September 4–10 and 20–23, 71% 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 Eleven percent of visitor group trips involved an overnight stay in a lodge, motel, rented condo/home, cabin, etc. in the park or local area, and 5% were overnight camping stays in the park or local area. Thirteen percent of visitor group trips were overnight stays in non-paid lodging, such as private homes.

Visitors reported their group’s expenditures in the park and within 50 miles of the park. Visitor groups spent an average of \$88 on their trips. Eighty-nine percent of visitor spending took place in the area outside the park.

Total visitor spending in 2012 in the park and within 50 miles of the park was \$17.2 million. The greatest proportions of expenditures were for overnight accommodations (26%) and gas and oil (22%). Overnight visitors staying in a lodge, motel, rented condo/home, cabin, etc. in the park or local area accounted for 42% of total spending.

Seventy-nine 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 \$12.0 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 a 12-county area around the park including Scott, Fentress, Morgan, Anderson, Campbell, and Pickett counties in Tennessee and Whitley, McCreary, Wayne, Pulaski, Laurel, and Knox counties in Kentucky. This region roughly coincides with the 50-mile radius around the park for which expenditures were reported.

Including direct and secondary effects, the \$12.0 million in visitor spending attributed to the park generated \$13.8 million in direct sales in the region, which supported 190 jobs. These jobs paid \$3.9 million in labor income, which was part of \$7.4 million in value added to the region.²

A separate study estimated impacts of the park employee payroll on the local economy³ and the results are reported herein. The park itself employed 56 people in FY 2010 with a total payroll including benefits of \$4.1 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were \$1.2 million in sales, supporting 68 jobs, \$4.4 million in labor income, and \$4.8 million in value added.

Local Economic Impacts of Big South Fork National River and Recreation Area

	<u>Sales</u>	<u>Jobs</u>	<u>Labor Income</u>	<u>Value Added</u>
Park Visitor Spending	\$13.8M	190	\$3.9M	\$7.4M
Park Payroll	<u>+\$1.2M</u>	<u>+ 68</u>	<u>+\$4.4M</u>	<u>+\$4.8M</u>
Park Visitor Spending + Payroll	\$15.0M	258	\$8.3M	\$12.2M

¹ Results in this study sometimes differ from those reported in the VSP study report (Begly and Le 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

Big South Fork National River and Recreation Area (NRRA) protects the Big South Fork of the Cumberland River and its tributaries in northeastern Tennessee and southeastern Kentucky. The 125,000-acre park was established in 1974. The park is located in Scott and Fentress counties in Tennessee and McCreary County in Kentucky. Big South Fork NRRA received 600,161 recreation visits in 2012 (Table 1).

Table 1. Recreation visits and overnight stays, Big South Fork NRRA, 2012

Month	Recreation visits	Overnight stays			Total
		Lodging	Developed camping*	Back country camping	
January	40,391	56	27	1,854	1,937
February	28,813	152	133	707	992
March	33,207	0	1,072	1,345	2,417
April	60,679	0	3,796	607	4,403
May	64,319	382	5,351	1,458	7,191
June	56,953	242	5,522	1,039	6,803
July	60,085	142	4,134	503	4,779
August	41,468	0	3,408	1,600	5,008
September	59,370	137	5,822	350	6,309
October	67,960	851	7,293	1,515	9,659
November	49,761	149	364	648	1,161
<u>December</u>	<u>37,155</u>	<u>128</u>	<u>86</u>	<u>263</u>	<u>477</u>
Total	600,161	2,239	37,008	11,889	51,136

*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 Big South Fork NRRA 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 Scott, Fentress, Morgan, Anderson, Campbell, and Pickett counties in Tennessee and Whitley, McCreary, Wayne, Pulaski, Laurel, and Knox counties in Kentucky. This 12-county region had a population of 410,287 (USCB 2012), gross regional product of \$11.1 billion (MIG, Inc. 2008), median household income of \$33,017, and family poverty rate of 18.4% (USCB 2012). State and local governments, including education, and food service and drinking places were the major employers in the region (MIG, Inc. 2008), and the region experienced a 10.0% 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 Big South Fork NRRRA Visitor Services Project (VSP) survey data (Begly and Le 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 Big South Fork NRRRA from September 4–10 and 20–23, 2012.⁴ The VSP survey measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a systematic, random sample of 751 visitor groups. Visitors returned 474 questionnaires resulting in a response rate of 63.1%.

Spending and economic impact estimates for Big South Fork NRRRA 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 12-county area around the park including Scott, Fentress, Morgan, Anderson, Campbell, and Pickett counties in Tennessee and Whitley, McCreary, Wayne, Pulaski, Laurel, and Knox counties in Kentucky. This area roughly coincides with the 50-mile radius around the park for which visitors reported expenditures.

The MGM2 model divides visitors into segments to help explain differences in spending across distinct user groups. Five segments were established for Big South Fork NRRRA visitors based on reported trip characteristics and lodging expenditures:

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

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

Motel: Visitors who reported motel expenses either in the park or local region.⁵

⁴ Results in this study sometimes differ from those reported in the VSP study report (Begly and Le 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 only motel within the park is the lodge at Charit Creek. Only seven respondents reported motel expenses inside the park, not enough to form a statistically significant segment; therefore, they are included in the motel segment which includes visitors reporting motel expenses both inside and outside the park.

Camping: Visitors who reported camping expenses in the park or local region.⁶

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.

⁶ Only 11 respondents reported camping expenses outside the park, not enough to form a statistically significant segment; therefore, they are included in the camping segment which includes visitors reporting camping expenses both inside and outside the park.

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, 63% of park entries were classified as day visits either by residents or by visitors from outside the local region, and the remaining 37% were classified as overnight visits including an overnight stay in the local region (Table 2). The average visitor group size ranged from 2.3 to 3.2 people across the five segments with an average visitor group of 2.7 people.⁸ The average length of stay in the local region on overnight trips was 2.3 nights. Seventy-nine 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	Motel	Camping	Other OVN	
Visitor segment share (park entries)	41%	22%	12%	10%	15%	100%
Average visitor group size	2.5	3.2	2.7	3.1	2.3	2.7
Length of stay (days or nights)	1.0	1.0	1.9	2.8	2.3	2.3
Re-entry rate (park entries per trip)	1.0	1.0	1.3	2.0	1.5	1.2
Percent primary purpose trips	100%	59%	61%	76%	58%	79%

The 600,161 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 600,161 recreation visits represented 195,694 visitor group trips (Table 3).

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

Measure	Segment					All visitors
	Local	Day trip	Motel	Camping	Other OVN	
Recreation visits	246,066	132,035	72,019	60,016	90,024	600,161
Visitor group trips	97,574	41,603	21,425	9,545	25,547	195,694
Percent of visitor group trips	50%	21%	11%	5%	13%	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 \$88 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 for day trips by local residents and \$60 for day trips by non-local visitors. Visitor groups staying in motels spent an average of \$337 on their trips, and those camping spent an average of \$190 on their trips. Visitor groups spent about 89% 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	Motel	Camping	Other OVN	
Inside Park						
Motels	0.00	0.00	18.18	2.86	0.00	2.13
Camping fees	0.00	0.00	0.29	47.35	0.00	2.34
Admission & fees	0.80	2.49	4.12	6.85	1.18	1.87
<u>Souvenirs & other expenses</u>	<u>1.67</u>	<u>5.35</u>	<u>3.26</u>	<u>6.46</u>	<u>5.86</u>	<u>3.41</u>
Total Inside Park	2.48	7.84	25.85	63.51	7.03	9.75
Outside Park						
Motels	0.00	0.00	162.88	0.00	0.00	17.83
Camping fees	0.00	0.00	0.00	15.73	0.00	0.77
Restaurants & bars	6.03	9.77	47.90	19.03	22.14	14.15
Groceries & takeout food	6.46	5.02	24.17	32.61	29.90	12.43
Gas & oil	10.39	18.40	37.36	45.01	30.95	19.42
Local transportation	0.03	0.96	4.46	0.00	0.00	0.71
Admission & fees	2.49	10.28	23.51	6.31	9.09	7.50
<u>Souvenirs & other expenses</u>	<u>3.24</u>	<u>7.62</u>	<u>10.91</u>	<u>7.83</u>	<u>5.91</u>	<u>5.58</u>
Total Outside Park	28.64	52.05	311.18	126.52	98.00	78.38
Total Inside & Outside Park	31.12	59.89	337.04	190.02	105.03	88.13

^{*}Weighted by percent visitor group trips.

The relative standard error at a 95% confidence level for the overall spending average was 15%. A 95% confidence interval for the overall visitor group spending average was therefore \$88 plus or minus \$13 or between \$75 and \$111.

On a per night basis, visitor groups staying in motels spent \$180 in the local region, and campers spent \$67 (Table 5). The average reported per-night lodging expense was \$97 for motels and \$22 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		
	Motel	Camping	Other OVN
Motels	96.56	1.01	0.00
Camping fees	0.16	22.26	0.00
Restaurants & bars	25.55	6.72	9.43
Groceries & takeout food	12.89	11.51	12.73
Gas & oil	19.93	15.89	13.18
Local transportation	2.38	0.00	0.00
Admission & fees	14.74	4.65	4.37
<u>Souvenirs & other expenses</u>	<u>7.56</u>	<u>5.04</u>	<u>5.01</u>
Total per visitor group per night	179.75	67.07	44.72

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. Big South Fork NRRRA visitors spent a total of \$17.2 million in the local region in 2012 (Table 6). Visitors who stayed in motels accounted for 42% of the total spending. Motel expenses represented 23% of total spending and gas and oil represented 22% (Figure 1).

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

Expenditures	Segment					All visitors
	Local	Day trip	Motel	Camping	Other OVN	
Inside Park						
Motels	0	0	389	27	0	417
Camping fees	0	0	6	452	0	458
Admission & fees	78	104	88	65	30	366
<u>Souvenirs & other expenses</u>	<u>163</u>	<u>222</u>	<u>70</u>	<u>62</u>	<u>150</u>	<u>667</u>
Total Inside Park	242	326	554	606	180	1,907
Outside Park						
Motels	0	0	3,490	0	0	3,490
Camping fees	0	0	0	150	0	150
Restaurants & bars	588	407	1,026	182	566	2,769
Groceries & takeout food	630	209	518	311	764	2,432
Gas & oil	1,014	766	800	430	791	3,801
Local transportation	3	40	95	0	0	138
Admission & fees	243	428	504	60	232	1,467
<u>Souvenirs & other expenses</u>	<u>316</u>	<u>317</u>	<u>234</u>	<u>75</u>	<u>151</u>	<u>1,093</u>
Total Outside Park	2,795	2,165	6,667	1,208	2,504	15,339
Total Inside & Outside Park	3,036	2,491	7,221	1,814	2,683	17,246
Segment Percent of Total	18%	14%	42%	11%	16%	100%

Note: Totals may not equal sum of individual categories due to rounding.

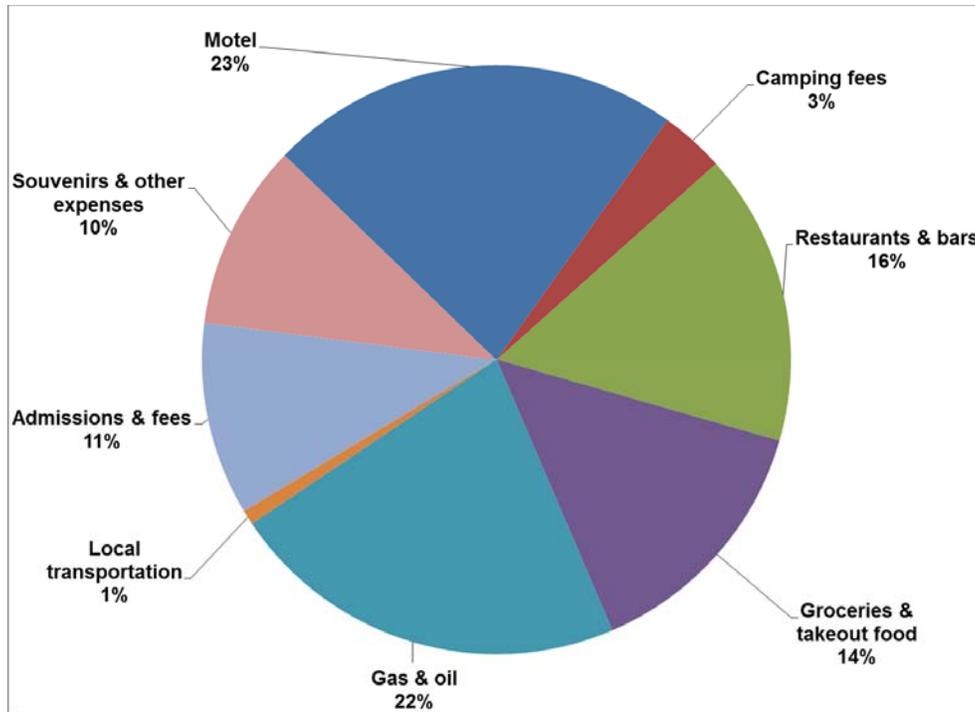


Figure 1. Big South Fork NRA visitor spending by category

Because visitors would come to the region whether or not the park existed, not all visitor spending can be attributed to the park. Twenty-one percent of visitor groups did not make the trip primarily to visit Big South Fork 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 \$12.0 million in visitor spending was attributed to the park visit (Table 7). This represented 70% 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	Camping	Other OVN	
Motels	0	0	3,236	27	0	3,264
Camping fees	0	0	6	579	0	585
Restaurants & bars	0	324	837	153	429	1,744
Groceries & takeout food	0	166	422	263	580	1,431
Gas & oil	0	610	653	363	600	2,226
Local transportation	0	32	78	0	0	110
Admission & fees	78	444	499	116	206	1,344
<u>Souvenirs & other expenses</u>	<u>163</u>	<u>475</u>	<u>261</u>	<u>125</u>	<u>264</u>	<u>1,288</u>
Total Attributed to Park	242	2,052	5,993	1,625	2,079	11,991
Percent of Spending Attributed to the Park	8%	82%	83%	90%	77%	70%
Percent of Attributed Spending	2%	17%	50%	14%	17%	100%

Economic Impacts of Visitor Spending

The economic impacts of Big South Fork NRRA 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 12-county region—Scott, Fentress, Morgan, Anderson, Campbell, and Pickett counties in Tennessee and Whitley, McCreary, Wayne, Pulaski, Laurel, and Knox counties in Kentucky.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 1.44. Every dollar of direct sales to visitors generated another \$0.44 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 \$17.2 million spent by park visitors generated \$19.0 million in sales, which supported 263 jobs in the local region (Table 8). These jobs paid \$5.4 million in labor income, which was part of \$10.2 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	3,906	48	847	2,033
Camping fees	608	8	192	272
Restaurants & bars	2,769	56	845	1,398
Groceries & takeout food	1,832	48	503	1,022
Gas & oil	138	3	70	107
Local transportation	615	13	295	442
Admission & fees	848	13	337	587
Souvenirs & other expenses	880	17	429	672
Wholesale trade	412	3	162	313
<u>Local production of goods</u>	<u>1,161</u>	<u>0</u>	<u>31</u>	<u>136</u>
Total Direct Effects	13,169	210	3,712	6,983
<u>Secondary Effects</u>	<u>5,821</u>	<u>53</u>	<u>1,729</u>	<u>3,168</u>
Total Effects	18,990	263	5,440	10,151

Note: Impacts of \$17.2 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 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 Big South Fork NRRRA reduced the overall impacts by about 28% (Table 9; see spending inclusion assumptions in previous section). Including direct and secondary effects, the \$12.0 million spent by park visitors and attributable to the park generated \$13.8 million in sales, which supported 190 jobs in the local region. These jobs paid \$3.9 million in labor income, which was part of \$7.4 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	3,264	40	708	1,698
Camping fees	585	8	185	262
Restaurants & bars	1,744	36	532	881
Groceries & takeout food	1,344	35	369	750
Gas & oil	110	2	55	84
Local transportation	362	7	174	260
Admission & fees	496	8	198	344
Souvenirs & other expenses	644	12	314	492
Wholesale trade	256	2	101	195
<u>Local production of goods</u>	<u>686</u>	<u>0</u>	<u>20</u>	<u>83</u>
Total Direct Effects	9,491	151	2,655	5,049
<u>Secondary Effects</u>	<u>4,273</u>	<u>39</u>	<u>1,274</u>	<u>2,325</u>
Total Effects	13,764	190	3,929	7,374

Note: Impacts of \$12.0 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. Big South Fork NRRRA itself employed 56 people in FY 2010 with a total payroll including benefits of \$4.1 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were \$1.2 million in sales, 68 jobs, \$4.4 million in labor income, and \$4.8 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 \$15.0 million in sales, which supported 258 jobs with labor income of \$8.3 million, which was part of a total value added of \$12.2 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 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 days spent visiting the park. Visitors were assumed to enter the park once each day.

Spending averages were derived from the 2012 Big South Fork NRRRA VSP survey data (Begly and Le 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 15%.

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 (6 cases), visiting the local region for more than 10 nights (3 cases), or spending more than \$1,003 (the mean plus two times the standard deviation of the mean for spending, 14 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 full week and an additional weekend in September. 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. Employment multipliers were updated to 2012 based on changes in consumer price indices between 2010 and 2012.

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 21% of visitors to Big South Fork NRRRA did not make the trip primarily to visit the park and 89% of 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	<p>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:</p> <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 Big South Fork NRRRA VSP questionnaire. Some expenditure categories were combined and renamed for MGM2 analysis.

Table B1. Expenditure categories in Big South Fork NRRRA questionnaire and MGM2 sector assignment

Questionnaire expenditure categories	Inside park	Outside park	MGM2 sector
Lodge, motel, rented condo/home, cabin, etc.	X	X	Motels
Camping fees and charges (including backcountry)	X	X	Camping fees
Horseback riding guide fees and charges	X	X	Admissions & fees
Water rafting/kayaking/canoeing guide fees and rental charges	X	X	Admissions & fees
Other guide fees and charges	X	X	Admissions & fees
Restaurants and bars		X	Restaurants & bars
Groceries and takeout food		X	Groceries & takeout food
Gas and oil (auto, RV, boat, etc.)		X	Gas & oil
Train tickets from Stearns to Blue Heron		X	Admissions & fees
Other transportation expenses (rental cars, taxies, auto repairs, but NOT airfare)		X	Local transportation
Admission, recreation, entertainment, excursion train fees		X	Admissions & fees
All other purchases (souvenirs, books, sporting goods, 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, Big South Fork NRA 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
Motels	11.72	0.22	0.52	1.29	1.48	16.24	0.37	0.79
Camping fees	13.04	0.32	0.45	1.35	1.62	18.96	0.52	0.81
Restaurants & bars	19.36	0.31	0.51	1.21	1.43	23.18	0.44	0.75
Groceries & takeout food	19.27	0.48	0.72	1.17	1.50	23.87	0.63	1.01
Gas & oil	12.18	0.40	0.69	1.19	1.47	16.53	0.54	0.97
Local transportation	19.86	0.50	0.77	1.10	1.43	23.73	0.64	1.02
Admission & fees	25.54	0.27	0.56	1.23	1.43	29.64	0.41	0.81
Souvenirs & other expenses	17.82	0.49	0.76	1.14	1.47	22.12	0.63	1.04
Local production of goods	0.35	0.03	0.12	1.16	1.20	1.70	0.08	0.21
Wholesale trade	6.82	0.39	0.76	1.13	1.40	10.55	0.52	1.00

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 11.7 jobs in the motel sector. Fifty-two percent of motel sector sales are value added, including 22% that goes to wages and salaries of motel employees. That means 48% 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 48% of sales spent on purchases by motels starts the rounds of indirect effects.

Multiplier effects: There is an additional 29 cents of indirect sales in the region for every dollar of direct motel sector sales (type I sales multiplier = 1.29). Total secondary sales are 48 cents per dollar of direct sales, which means 29 cents in indirect effects and 19 cents in induced effects.

An additional 4.5 jobs are created from secondary effects of each million dollars in motel sector sales (16.2 total jobs – 11.7 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 15% (37%-22%), and the secondary effects on value added for each dollar of motel sector sales are 27% (79-52%). Including secondary effects, every million dollars of motel sector sales in the region yields \$1.48 million in sales, \$370,000 in income, and \$790,000 in value added.

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