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Impacts of Visitor Spending on the Local Economy

Springfield Armory National Historic Site, 2013

Natural Resource Report NPS/NRSS/EQD/NRR—2014/827

ON THE COVER
Springfield Armory National Historic Site
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Contents

Page

Figures v

Tables v

Appendices v

Executive Summary vii

Acknowledgments viii

Introduction 1

Methods 3

Results 5

Visits 5

Visitor Spending 6

Economic Impacts of Visitor Spending 9

Impacts of All Visitor Spending 9

Impacts of Visitor Spending Attributed to the Park 10

Economic Impacts of the NPS Park Payroll 11

Combined Economic Impacts 11

Study Limitations and Errors 13

Literature Cited 15

Figures

Page

Figure 1. Springfield Armory NHS visitor spending by category 8

Tables

Page

Table 1. Recreation visits, Springfield Armory NHS, 2013 1

Table 2. Selected visit/trip characteristics by segment, 2013 5

Table 3. Recreation visits and visitor group trips by segment, 2013 5

Table 4. Average spending by segment (dollars per visitor group per trip) 6

Table 5. Average spending per night for visitor groups on overnight trips (dollars per visitor group per night) 7

Table 6. Total visitor spending by segment, 2013 (thousands of dollars) 7

Table 7. Total spending attributed to park visits, 2013 (thousands of dollars) 8

Table 8. Impacts of all visitor spending on the local economy, 2013 10

Table 9. Economic impacts of visitor spending attributed to the park, 2013 11

Appendices

Page

Appendix A: Glossary 17

Appendix B: Expenditure Sector Assignments 19

Appendix C: Economic Ratios and Multipliers 21

Executive Summary

Springfield Armory National Historic Site hosted 17,783 recreation visits in 2013. Adjustments for visitor group size and re-entries resulted in 6,793 visitor group trips to the park in 2013. Based on a 2013 Visitor Services Project survey conducted July 15–August 8, 51% of these visitor group trips were made by local residents or non-locals on day trips, not including an overnight stay within 100 miles of the park.[1] Thirty-three percent of visitor group trips involved an overnight stay in paid lodging, and 16% 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 100 miles of the park. Visitor groups spent an average of $191 on their trips. Ninety-four percent of visitor spending took place in the area outside the park.

Total visitor spending in 2013 in the park and within a one-hour drive of the park was $1.3 million. The greatest proportion of expenditures was for overnight accommodations (36%). Overnight visitors staying in paid lodging in the local area accounted for 77% of total spending.

Forty-six percent of visitor groups indicated that visiting the park 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 $816,000 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 14-county area around the park including Hampden, Hampshire, Franklin, Berkshire, and Worcester counties in Massachusetts, Litchfield, Hartford, Tolland, and Windham counties in Connecticut, Cheshire County in New Hampshire, Windham and Bennington counties in Vermont, and Rensselaer and Columbia counties in New York. This region roughly coincides with the 100-mile radius around the park for which expenditures were reported.

Including direct and secondary effects, the $816,000 in visitor spending attributed to the park generated $1,155,000 in direct sales in the region, which supported 12.2 jobs. These jobs paid $407,000 in labor income, which was part of $663,000 in value added to the region.[2]

A separate study estimated impacts of the park employee payroll on the local economy[3] and the results are reported herein. The park itself employed 18 people in FY 2010 with a total payroll including benefits of $1.0 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were $689,000 in sales, supporting 22.7 jobs and $1,271,000 in labor income, which is part of $1,457,000 in value added.

Local Economic Impacts of Springfield Armory National Historic Site

	Sales	Jobs	Labor Income	Value Added
Park Visitor Spending	$1,155K	12.2	$407K	$663K
Park Payroll	+$689K	+22.7	+$1,271K	+$1,457K
Park Visitor Spending + Payroll	$1,844K	34.9	$1,678K	$2,120K

[1] Results in this study sometimes differ from those reported in the VSP study report (Manni and Le 2014) 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).

Introduction

Springfield Armory National Historic Site (NHS) commemorates the critical role of the nation's first armory by preserving and interpreting the world's largest historic U.S. military small arms collection, along with historic archives, buildings, and landscapes. The 55-acre park is located in Springfield, Massachusetts in Hampden County. Springfield Armory NHS received 17,783 recreation visits in 2013 (Table 1).

Table 1. Recreation visits, Springfield Armory NHS, 2013

Month	Recreation visits
January	744
February	934
March	1,407
April	1,205
May	1,899
June	2,544
July	2,874
August	1,784
September	1,407
October	708
November	1,311
December	966
Total	**17,783**

Source: NPS Visitor Use Statistics 2013.

The purpose of this study is to estimate the annual, local economic impacts of visitors to Springfield Armory NHS in 2013. Economic impacts were measured as 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); 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 Hampden, Hampshire, Franklin, Berkshire, and Worcester counties in Massachusetts, Litchfield, Hartford, Tolland, and Windham counties in Connecticut, Cheshire County in New Hampshire, Windham and Bennington counties in Vermont, and Rensselaer and Columbia counties in New York. This 14-county region had a population of 3.4 million (USCB 2013), gross regional product of $155.3 billion (MIG, Inc. 2008), median household income of $61,345, and family poverty rate of 7.3% (USCB 2013). State and local government, including education, and food services and drinking places were the major employers in the region (MIG, Inc. 2008), and the region experienced a 7.6% unemployment rate in 2013 (BLS 2013).

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 segment;
2. spending averages for each segment; and
3. economic multipliers for the local region.

Inputs were estimated from the Springfield Armory NHS Visitor Services Project (VSP) survey data (Manni and Le 2014), National Park Service Visitor Use Statistics (2013), and Impact Analysis for Planning (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 Springfield Armory NHS from July 15–August 8, 2013.[4] The VSP survey measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a systematic, random sample of 350 visitor groups. Visitors returned 228 questionnaires resulting in a response rate of 65.1%.

Spending and economic impact estimates for Springfield Armory NHS are based in part on the 2013 VSP survey data. Visitors were asked to report expenditures inside the park and within 100 miles of the park. The local region for determining economic impact was defined as a 14-county area around the park including Hampden, Hampshire, Franklin, Berkshire, and Worcester counties in Massachusetts, Litchfield, Hartford, Tolland, and Windham counties in Connecticut, Cheshire County in New Hampshire, Windham and Bennington counties in Vermont, and Rensselaer and Columbia counties in New York. This area roughly coincides with the 100-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. Four segments were established for Springfield Armory NHS visitors based on reported trip characteristics and lodging expenditures:

Local: Visitors who were residents of the local region, i.e., lived within 100 miles of the park.

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

Paid overnight: Visitors who reported motel or camping fee expenses in the local region.[5]

[4] Results in this study sometimes differ from those reported in the VSP study report (Manni and Le 2014) 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. Only eight respondents reported camping fee expenses, not enough to form a statistically valid segment; therefore, they are combined with visitors who stayed in motels to form the paid overnight segment.

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.

[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, 49% of park entries were classified as day visits either by residents or by visitors from outside the local region, and the remaining 51% were classified as overnight visits including an overnight stay in the local region (Table 2). The average visitor group size ranged from 2.4 to 3.0 people across the four segments with an average visitor group of 2.6 people.[7] The average length of stay in the local region on overnight trips was 2.9 nights. Forty-six percent of visitor groups indicated that visiting the park was the primary reason for their trip to the area.

Table 2. Selected visit/trip characteristics by segment, 2013

	Segment				
Characteristic	**Local**	**Day trip**	**Paid overnight**	**Other OVN**	**All visitors**
Visitor segment share (park entries)	21%	28%	33%	18%	100%
Average visitor group size	2.4	2.5	2.6	3.0	2.6
Length of stay (days or nights)	1.0	1.0	2.3	3.9	2.9
Re-entry rate (park entries per trip)	1.0	1.0	1.0	1.0	1.0
Percent primary purpose trips	100%	38%	34%	18%	46%

The 17,783 recreation visits in 2013 were allocated to the four 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 17,783 recreation visits represented 6,793 visitor group trips (Table 3).

Table 3. Recreation visits and visitor group trips by segment, 2013

	Segment				
Measure	**Local**	**Day trip**	**Paid overnight**	**Other OVN**	**All visitors**
Recreation visits	3,681	4,997	5,904	3,201	17,783
Visitor group trips	1,516	1,990	2,232	1,056	6,793
Percent of visitor group trips	22%	29%	33%	16%	100%

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

Visitor Spending

The VSP survey collected data about expenditures of visitor groups inside the park and within 100 miles of the park.[8] Spending averages were computed on a visitor group trip basis for each segment. The average visitor group spent $191 on the trip, including expenditures inside the park and within 100 miles of the park (Table 4). On a visitor group trip basis, average spending was $25 for day trips by local residents and $62 for day trips by non-local visitors. Visitor groups staying in paid overnight accommodations spent an average of $447 on their trips. Visitor groups spent about 94% of their total spending outside the park.

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

	Segment				
Expenditures	**Local**	**Day trip**	**Paid overnight**	**Other OVN**	**All visitors***
Inside Park					
Souvenirs & other expenses	6.49	9.98	14.65	12.54	11.14
Total Inside Park	**6.49**	**9.98**	**14.65**	**12.54**	**11.14**
Outside Park					
Motels	0.00	0.00	208.03	0.00	68.36
Camping fees	0.00	0.00	7.33	0.00	2.41
Restaurants & bars	8.33	18.25	84.97	43.21	41.84
Groceries & takeout food	2.67	3.52	8.09	19.95	7.39
Gas & oil	3.73	16.02	41.92	22.64	22.82
Local transportation	0.00	4.54	24.03	6.67	10.26
Admission & fees	0.67	3.64	20.99	13.31	10.18
Souvenirs & other expenses	3.00	5.97	37.28	12.54	16.61
Total Outside Park	**18.40**	**51.93**	**432.63**	**118.31**	**179.86**
Total Inside & Outside Park	**24.89**	**61.92**	**447.28**	**130.85**	**191.00**

*Weighted by percent visitor group trips.

The relative standard error at a 95% confidence level for the overall spending average was 19%. A 95% confidence interval for the overall visitor group spending average was therefore $191 plus or minus $36 or between $155 and $227.

On a per night basis, visitor groups staying in paid overnight accommodations spent $193 in the local region (Table 5). The average reported per-night motel expense was $90.

[8] 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)

	Segment	
Expenditures	**Paid overnight**	**Other OVN**
Motels	89.53	0.00
Camping fees	3.16	0.00
Restaurants & bars	36.57	11.09
Groceries & takeout food	3.48	5.12
Gas & oil	18.04	5.81
Local transportation	10.34	1.71
Admission & fees	9.03	3.42
Souvenirs & other expenses	22.35	6.44
Total per visitor group per night	**192.50**	**33.60**

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. Springfield Armory NHS visitors spent a total of $1.3 million in the local region in 2013 (Table 6). Visitors who stayed in paid overnight accommodations accounted for 77% of the total spending. Motel expenses represented 36% of total spending (Figure 1).

Table 6. Total visitor spending by segment, 2013 (thousands of dollars)

	Segment				
Expenditures	**Local**	**Day trip**	**Paid overnight**	**Other OVN**	**All visitors**
Inside Park					
Souvenirs & other expenses	10	20	33	13	76
Total Inside Park	**10**	**20**	**33**	**13**	**76**
Outside Park					
Motels	0	0	464	0	464
Camping fees	0	0	16	0	16
Restaurants & bars	13	36	190	46	284
Groceries & takeout food	4	7	18	21	50
Gas & oil	6	32	94	24	155
Local transportation	0	9	54	7	70
Admission & fees	1	7	47	14	69
Souvenirs & other expenses	5	12	83	13	113
Total Outside Park	**28**	**103**	**966**	**125**	**1,222**
Total Inside & Outside Park	**38**	**123**	**998**	**138**	**1,297**
Segment Percent of Total	3%	9%	77%	11%	100%

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

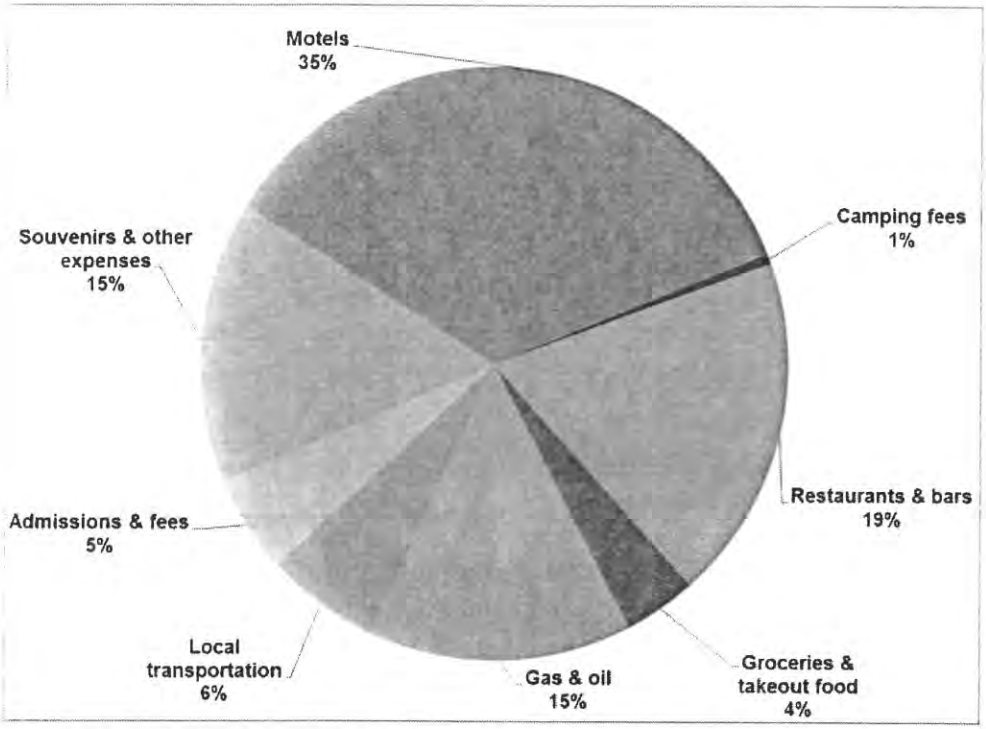

Figure 1. Springfield Armory NHS visitor spending by category

Because visitors would come to the region whether or not the park existed, not all visitor spending can be attributed to the park. Fifty-four percent of visitor groups did not make the trip primarily to visit Springfield Armory NHS. 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 $816,000 in visitor spending was attributed to the park visit (Table 7). This represented 63% of the overall visitor spending total.

Table 7. Total spending attributed to park visits, 2013 (thousands of dollars)

	Segment				
Expenditures	**Local**	**Day trip**	**Paid overnight**	**Other OVN**	**All visitors**
Motels	0	0	289	0	289
Camping fees	0	0	11	0	11
Restaurants & bars	0	25	127	27	179
Groceries & takeout food	0	5	11	8	24
Gas & oil	0	22	58	9	90
Local transportation	0	6	33	3	42
Admission & fees	0	5	29	6	40
Souvenirs & other expenses	10	28	85	18	141
Total Attributed to Park	**10**	**91**	**644**	**71**	**816**
Percent of Spending Attributed to the Park	26%	74%	64%	52%	63%
Percent of Attributed Spending	1%	11%	79%	9%	100%

Economic Impacts of Visitor Spending

The economic impacts of Springfield Armory NHS 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 14-county region—Hampden, Hampshire, Franklin, Berkshire, and Worcester counties in Massachusetts, Litchfield, Hartford, Tolland, and Windham counties in Connecticut, Cheshire County in New Hampshire, Windham and Bennington counties in Vermont, and Rensselaer and Columbia counties in New York.[9] Economic ratios and multipliers for the region were estimated using IMPAN (version 3, MIG, Inc. 2008) with 2008 data.[10] Multipliers were adjusted to 2013 based on structural changes in the national IMPLAN models between 2008 and 2009 and price changes between 2008 and 2013 (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 1.68. Every dollar of direct sales to visitors generated another $0.68 in secondary sales through indirect and induced effects.[11] (See Appendix A: Glossary for further explanation of terms.)

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

Impacts of All Visitor Spending

Using all visitor spending and including direct and secondary effects, the $1.3 million spent by park visitors generated $1.8 million in sales, which supported 19.3 jobs in the local region (Table 8). These jobs paid $643,000 in labor income, which was part of $1,048,000 in value added to the region.[12]

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

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

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

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

Table 8. Impacts of all visitor spending on the local economy, 2013

Sector/Expenditure category	Sales (thousands of dollars)	Jobs	Labor Income (thousands of dollars)	Value Added (thousands of dollars)
Direct Effects				
Motels	464	4.6	146	260
Camping fees	16	0.2	8	8
Restaurants & bars	284	4.9	106	150
Groceries & takeout food	69	1.2	28	43
Gas & oil	70	1.0	39	48
Local transportation	13	0.2	7	11
Admission & fees	35	0.4	18	29
Souvenirs & other expenses	94	1.8	49	80
Wholesale trade	33	0.2	13	22
Local production of goods	13	0.1	3	4
Total Direct Effects	**1,092**	**14.6**	**415**	**654**
Secondary Effects	739	4.7	228	394
Total Effects	**1,830**	**19.3**	**643**	**1,048**

Note: Impacts of $1.3 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 the motels sector.

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 Springfield Armory NHS reduced the overall impacts by about 37% (Table 9; see spending inclusion assumptions in previous section). Including direct and secondary effects, the $816,000 spent by park visitors and attributable to the park generated $1,155,000 in sales, which supported 12.2 jobs in the local region. These jobs paid $407,000 in labor income, which was part of $663,000 in value added to the region.

Table 9. Economic impacts of visitor spending attributed to the park, 2013

Sector/Expenditure category	Sales (thousands of dollars)	Jobs	Labor Income (thousands of dollars)	Value Added (thousands of dollars)
Direct Effects				
Motels	289	2.8	91	162
Camping fees	11	0.1	5	6
Restaurants & bars	179	3.1	67	94
Groceries & takeout food	40	0.7	16	25
Gas & oil	42	0.6	23	29
Local transportation	6	0.1	3	5
Admission & fees	20	0.2	10	17
Souvenirs & other expenses	70	1.3	37	60
Wholesale trade	22	0.1	8	14
Local production of goods	9	0.1	2	3
Total Direct Effects	**689**	**9.2**	**263**	**414**
Secondary Effects	466	3.0	144	248
Total Effects	**1,155**	**12.2**	**407**	**663**

Note: Impacts of $816,000 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. Springfield Armory NHS itself employed 18 people in FY 2010 with a total payroll including benefits of $1.0 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were $689,000 in sales, 22.7 jobs, $1,271,000 in labor income, which was part of $1,457,000 value added (Stynes 2011).

Combined Economic Impacts

The combined impacts to the region of visitor spending attributable to the park and NPS payroll were $1,844,000 in sales, which supported 34.9 jobs with labor income of $1,678,000, which was part of a total value added of $2,120,000.

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 Visitor Use Statistics (2013). 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 the number of days respondents reported visiting the park on their trip and assuming one entry per day.

Spending averages were derived from the 2013 Springfield Armory NHS VSP survey data (Manni and Le 2014). Estimates from the survey are subject to sampling errors, measurement errors, and potential seasonal biases. The overall spending average is subject to a sampling error of 19%.

Spending averages are also sensitive to decisions about outliers and treatment of missing data. In order to estimate spending averages, incomplete spending data were filled with zeros. Visitor groups visiting the local region for more than 14 nights (2 cases) or spending more than $1,559 (the mean plus two times the standard deviation of the mean for spending, 6 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 from July 15–August 8. 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 dataset available for this analysis was 2008. National IMPLAN multiplier data were available for 2009, so local employment, labor income, and value added multipliers were updated to 2009 using 2008/2009 national ratios. In addition, local employment multipliers were updated to 2013 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 54% of visitors to Springfield Armory NHS did not make the trip primarily to visit the park and 94% 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	Converts various economic measures from one to another. For example, direct sales can be used to estimate direct effects on jobs, personal income, and value added by applying economic ratios. That is: • Direct jobs = direct sales * jobs to sales ratio • Direct personal income = direct sales * personal income to sales ratio • Direct value added = direct sales * value added to sales ratio.
Indirect effects	Changes in sales, income and jobs in industries that supply goods and services to the businesses that sell directly to visitors, i.e., businesses in the supply chain. For example, linen suppliers benefit from visitor spending at motels.
Induced effects	Changes in economic activity in the region resulting from household spending of income earned through a direct or indirect effect of visitor spending. For example, motel and linen supply employees live in the region and spend their incomes on housing, groceries, education, clothing and other goods and services. IMPLAN's Social Accounting Matrix (SAM) multipliers also include induced effects resulting from local/state/federal government spending.
Jobs	The number of jobs in the region supported by visitor spending. Job estimates are not full time equivalents, but include both fulltime and part-time positions.
Labor income	Wage and salary income, sole proprietor (business owner) income and employee payroll benefits.
Regional purchase coefficient (RPC)	The proportion of demand within a region supplied by producers within that region.
Retail margin	The markup to the price of a product when a product is sold through a retail trade activity. Retail margin is calculated as sales receipts minus the cost of goods sold.

Term	Definition
Sales	Direct sales (retail goods and services) of firms within the region to park visitors.
Secondary effects	Changes in the economic activity in the region that result from the re-circulation of money spent by visitors. Secondary effects include indirect and induced effects.
Total effects	Sum of direct, indirect and induced effects. • Direct effects accrue largely to tourism-related businesses in the area. • Indirect effects accrue to a broader set of businesses that serve these tourism firms. • Induced effects are distributed widely across a variety of local businesses.
Value added	Labor income plus property income (rents, dividends, royalties, interest) and 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 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 Springfield Armory NHS VSP questionnaire. Some expenditure categories were combined and renamed for MGM2 analysis.

Table B1. Expenditure categories in Springfield Armory NHS 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	Camping 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
Other transportation expenses (rental cars, taxis, auto repairs, but NOT airfare)		X	Local transportation
Admission, recreation, entertainment, guide fees		X	Admissions & fees
All other expenditures (books, postcards, donations, souvenirs, etc.)	X	X	Souvenirs & other expenses

X = category included in questionnaire.

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

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

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

Source: IMPLAN (MIG, Inc. 2008).

Appendix C: Economic Ratios and Multipliers

Table C1. Economic ratios and multipliers for selected tourism-related sectors, Springfield Armory NHS region, 2013

	Direct effects			Total effects multipliers				
Sector	Jobs/ $MM sales	Income/ sales	Value added/ sales	Sales I	Sales SAM	Job II/ $MM sales	Income II/ sales	Value added II/ sales
Motels	9.84	0.31	0.56	1.34	1.69	14.29	0.53	0.92
Camping fees	12.33	0.47	0.50	1.39	1.79	17.83	0.73	0.94
Restaurants & bars	17.20	0.37	0.53	1.32	1.67	21.29	0.57	0.88
Groceries & takeout food	17.82	0.52	0.84	1.30	1.70	22.34	0.73	1.22
Gas & oil	11.24	0.51	0.83	1.26	1.56	14.86	0.69	1.14
Local transportation	14.96	0.55	0.69	1.16	1.57	18.85	0.74	1.00
Admission & fees	17.83	0.41	0.62	1.50	1.78	22.83	0.65	1.05
Souvenirs & other expenses	18.84	0.52	0.85	1.29	1.70	23.39	0.74	1.23
Local production of goods	5.58	0.20	0.32	1.23	1.47	5.93	0.24	0.40
Wholesale trade	4.97	0.38	0.66	1.28	1.65	9.27	0.60	1.02

Source: IMPLAN (MIG, Inc. 2008), updated to 2013.

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 Motels sector sales (i.e., short-term lodging room rentals) creates 9.8 jobs in the Motels sector. Fifty-six percent of Motels sector sales are value added, including 31% that goes to wages and salaries of motel employees. That means 44% of Motels sector sales goes to purchase inputs by motels (e.g., linens, cleaning supplies). The wage and salary income creates the induced effects, and the 44% of sales spent on purchases by motels starts the rounds of indirect effects.

Multiplier effects: There is an additional 34 cents of indirect sales in the region for every dollar of direct Motels sector sales (type I sales multiplier = 1.34). Total secondary sales are 69 cents

per dollar of direct sales, which means 34 cents in indirect effects and 35 cents in induced effects. An additional 5.5 jobs are created from secondary effects of each million dollars in Motels sector sales (14.3 total jobs – 9.8 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 Motels sector sales are 22% (53%-31%), and the secondary effects on value added for each dollar of Motels sector sales are 36% (92%-56%). Including secondary effects, every million dollars of Motels sector sales in the region yields $1.69 million in sales, $530,000 in income, and $920,000 in value added.

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