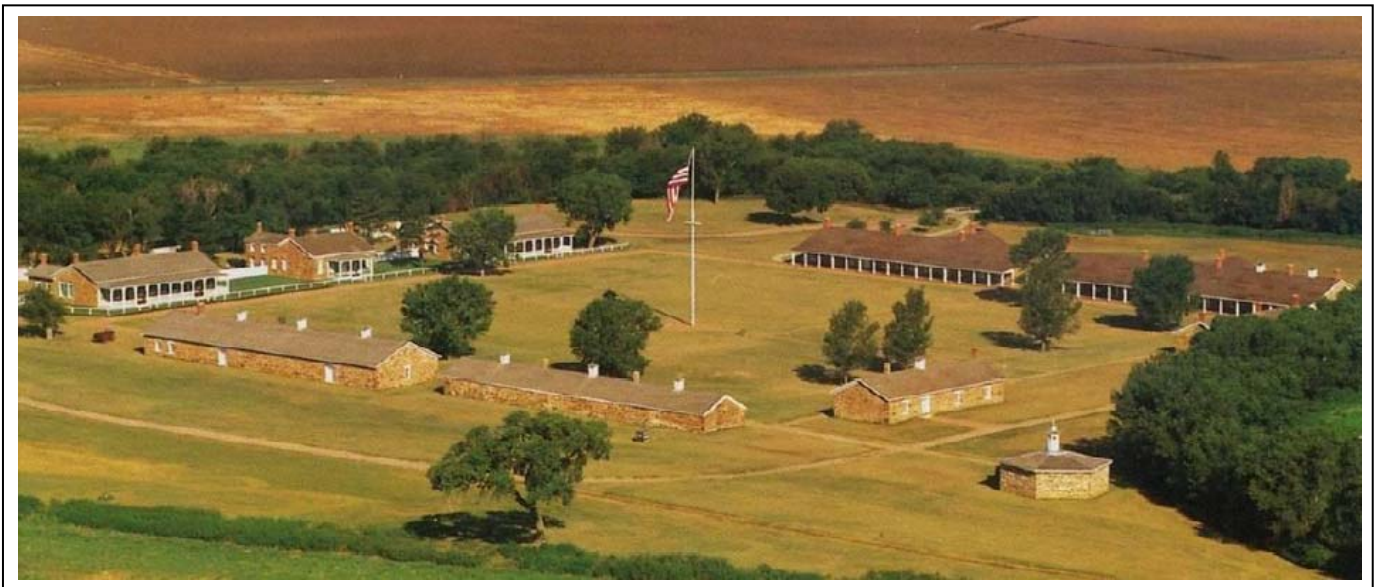




# Impacts of Visitor Spending on the Local Economy:

## *Fort Larned National Historic Site, 2009*



**ON THE COVER**

Photo courtesy of Fort Larned National Historic Site

---

# **Impacts of Visitor Spending on the Local Economy:** *Fort Larned National Historic Site, 2009*

Philip S. Cook

Visitor Services Project  
Park Studies Unit  
University of Idaho  
Moscow, ID 83844-1139

April 2011

U.S. Department of the Interior  
National Park Service  
Natural Resource Stewardship and Science  
Fort Collins, Colorado

The National Park Service, Natural Resource Stewardship and Science office in Fort Collins, Colorado publishes a range of reports that address natural resource topics of interest and applicability to a broad audience in the National Park Service and others in natural resource management, including scientists, conservation and environmental constituencies, and the public.

This manuscript received the appropriate level of peer review to ensure that the information is scientifically credible, technically accurate, appropriately written for the intended audience, and designed and published in a professional manner.

Data in this report were collected and analyzed using methods based on established, peer-reviewed protocols and were analyzed and interpreted within the guidelines of the protocols.

Views, statements, findings, conclusions, recommendations, and data in this report do not necessarily reflect views and policies of the National Park Service, U.S. Department of the Interior. Mention of trade names or commercial products does not constitute endorsement or recommendation for use by the U.S. Government.

This report is available from the Park Studies Unit, University of Idaho, Moscow (<http://www.psu.uidaho.edu/>).

Please cite this publication as:

Cook, P.S. 2011. Impacts of visitor spending on the local economy: Fort Larned National Historic Site, 2009. National Park Service, Fort Collins, Colorado.

# Contents

	Page
Figures.....	iv
Tables.....	iv
Appendices.....	iv
Executive Summary .....	v
Acknowledgments.....	vi
Introduction.....	1
Methods.....	2
Results.....	3
Visits .....	3
Visitor Spending .....	4
Economic Impacts of Visitor Spending .....	7
Impacts of the NPS Park Payroll .....	8
Study Limitations and Errors .....	9
Literature Cited .....	10

## Figures

	Page
<b>Figure 1.</b> Fort Larned National Historic Site visitor spending by spending category .....	6

## Tables

<b>Table 1.</b> Recreation visits, Fort Larned National Historic Site, 2009. ....	1
<b>Table 2.</b> Selected visit/trip characteristics by segment, 2009. ....	3
<b>Table 3.</b> Recreation visits and visitor group trips by segment, 2009. ....	4
<b>Table 4.</b> Average spending by segment (\$ per visitor group per trip). ....	4
<b>Table 5.</b> Average spending per night for visitor groups on overnight trips (\$ per visitor group per night).....	5
<b>Table 6.</b> Total visitor spending by segment, 2009 (\$000's).....	5
<b>Table 7.</b> Total spending attributed to park visits, 2009 (\$000's). ....	6
<b>Table 8.</b> Impacts of all visitor spending on the local economy, 2009.....	8
<b>Table 9.</b> Economic impacts of visitor spending attributed to the park, 2009.....	8
<b>Table B1.</b> Economic ratios and multipliers for selected tourism-related sectors, Fort Larned NHS region, 2009. ....	13
<b>Table B2.</b> MGM2 sector correspondence to IMPLAN and 2007 NAICS sectors. ....	14

## Appendices

Appendix A: Glossary.....	11
Appendix B: Economic Multipliers and IMPLAN Sectors .....	13

## Executive Summary

Fort Larned National Historic Site hosted 27,443 recreation visits in 2009. Adjustments for visitor group size and re-entries resulted in 10,746 visitor group trips to the park in 2009. Based on a 2009 Visitor Services Project (VSP) survey conducted May 25-June 27, 41% of these visitor group trips were day trips not including an overnight stay 60 miles of the park.<sup>1</sup> Forty-two percent of the visitor group trips involved an overnight stay in motels, lodges or cabins outside the park, and 7% of visitor group trips were overnight stays in campgrounds outside the park.

Visitors reported their group's expenditures inside the park and in the surrounding communities within 60 miles of the park. In 2009 the average visitor group size was 2.5 people and spent an average of \$133 in the park and within 60 miles of the park. Broken down further, the average spending per visitor group was \$35 for visitors from the local region on day trips, \$35 for non-local visitors on day trips, \$227 for visitors staying in motels or lodges outside the park, and \$159 for visitors camping outside the park. Overall 95% of spending took place outside the park.

Total visitor spending in 2009 within 60 miles of the park was \$1.4 million including \$68,000 inside the park. The greatest proportions of expenditures were for lodging (38%), restaurant meals and bar expenses (19%), and gas and oil expenses (19%). Overnight visitors staying in motels or lodges outside the park accounted for 72% of the total spending.

Forty-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 trip purpose yields \$1.1 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 (IMPLAN) of the local economy. The local region was defined as a fifteen county region including Ford, Hodgeman, Ness, Rush, Ellis, Russell, Barton, Ellsworth, Rice, Reno, Stafford, Pratt, Kiowa, Edwards, and Pawnee counties in Kansas. This region roughly coincides with the 60 mile radius for which spending was reported.

Including direct and secondary effects, the \$1.1 million in visitor spending attributed to the park generates \$1.2 million in sales in the region, which supports 20 jobs. These jobs pay \$378,000 in labor income, which is part of \$641,000 in value added to the region.<sup>2</sup>

A separate study estimated impacts of the park employee payroll on the local economy.<sup>3</sup> The park itself employed 17 people in FY 2010 with a total payroll including benefits of \$920,621. Including secondary effects, the local impacts of the park payroll in FY 2010 were \$340,000 in sales, 21 jobs, \$1.0 million in labor income, and \$1.1 million in value added.

The combined regional impacts of visitor spending attributable to the park and NPS payroll are \$1.5 million in sales which supports 41 jobs with labor income of \$1.4 million, which is part of a total value added of \$1.7 million.

<sup>1</sup> Results in this study sometimes differ from those reported in the VSP survey report (Blotkamp et al. 2010) because the current analysis excludes some cases as outliers. See Study Limitations and Errors section.

<sup>2</sup> 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).

<sup>3</sup> Stynes (2011).

## **Acknowledgments**

The author thanks Dr. Dan Stynes, Professor Emeritus, Michigan State University, for his assistance with MGM2, and Margaret Littlejohn for her review of an early draft of this report.



# Introduction

Fort Larned National Historic Site (NHS) preserves Fort Larned, which operated from 1859 to 1878. The fort was established to protect traffic along the Santa Fe Trail from hostile American Indians and serve as an agency for the administration of the Central Plains Indians. The 718 acre site became a National Historic Site in 1964. The park is located six miles west of Larned, in central Kansas. Fort Larned NHS received 27,443 recreation visits in 2009 (Table 1).

**Table 1.** Recreation visits, Fort Larned National Historic Site, 2009

<b>Month</b>	<b>Recreation Visits</b>
January	670
February	684
March	1,012
April	1,622
May	3,432
June	4,167
July	4,179
August	3,777
September	2,546
October	2,732
November	1,708
December	914
<b>Total</b>	<b>27,443</b>

Source: NPS Public Use Statistics 2009.

The purpose of this study is to estimate the local economic impacts of visitors to Fort Larned NHS in 2009. Economic impacts are 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.) The local economic region defined for this study includes Ford, Hodgeman, Ness, Rush, Ellis, Russell, Barton, Ellsworth, Rice, Reno, Stafford, Pratt, Kiowa, Edwards, and Pawnee counties, Kansas.

This 15-county region of Kansas has a population of 208,173 (USCB 2010), gross regional product of \$8.0 billion (MIG, Inc. 2008), median household income of \$41,669, and family poverty rate of 9.5% (USCB 2010). State and local governments are the major employers in the region (MIG, Inc. 2008), and the region experienced a 4.8% unemployment rate in 2009 (BLS 2009).

## Methods

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

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 are estimated from the Fort Larned NHS Visitor Services Project (VSP) visitor survey (Blotkamp et al. 2010), National Park Service Public Use Statistics (2009), 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 Fort Larned NHS from May 25-June 27, 2009 (Blotkamp et al. 2010).<sup>4</sup> This survey measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a systematic, random sample of 340 visitor groups. Visitors returned 261 questionnaires resulting in a response rate of 77%.

Spending and economic impact estimates for Fort Larned NHS are based on the 2009 VSP survey. Visitors were asked to report expenditures within 60 miles of the park. The local region for determining economic impact was defined as a fifteen county area around the park including Ford, Hodgeman, Ness, Rush, Ellis, Russell, Barton, Ellsworth, Rice, Reno, Stafford, Pratt, Kiowa, Edwards, and Pawnee counties in central Kansas, which roughly coincides with the 60 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 Fort Larned NHS visitors based on reported trip characteristics and lodging expenditures:

**Local:** Visitors from the local region.

**Day trip:** Visitors from outside the local region, not staying overnight within 60 miles of the park.

**Motel-out:** Visitors reporting motel expenses outside the park within 60 miles of the park.

**Camp-out:** Visitors reporting camping expenses outside the park within 60 miles of the park.

**Other overnight (Other OVN):** Visitors staying overnight in the local region but not reporting any lodging expenses. This segment includes visitors staying in private homes, with friends or relatives, or in other unpaid lodging.<sup>5</sup>

---

<sup>4</sup> Results in this study sometimes differ from those reported in the VSP survey report (Blotkamp et al. 2010) because the current analysis excludes some cases as outliers. See Study Limitations and Errors section.

<sup>5</sup> 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.

The VSP survey was 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.

## Results

### Visits

Based on the VSP survey, 45% of park entries were classified as day trip visits by either local residents or visitors from outside the region, and 55% were classified as overnight visits including an overnight stay in the local region (Table 2). The average visitor group size ranged from 2.1 to 3.2 people across the five segments with an average visitor group of 2.5 people.<sup>6</sup> The average length of stay in the local region on overnight trips was 1.7 nights.

**Table 2.** Selected visit/trip characteristics by segment, 2009

Characteristic	Segment					All visitors
	Local	Day trip	Motel-out	Camp-out	Other OVN	
Visitor segment share (park entries)	11%	34%	37%	6%	12%	100%
Average visitor group size	3.2	2.6	2.2	2.1	3.1	2.5
Length of stay (days or nights)	1.0	1.0	1.5	1.5	2.4	1.7
Re-entry rate (park entries per trip)	1.0	1.0	1.0	1.1	1.1	1.0
Percent primary purpose trips	100%	53%	38%	43%	28%	44%

Forty-four percent of visitor groups indicated that visiting the park was the primary reason for their trip to the area. Other stated reasons were visiting friends and relatives in the area, business, or visiting other area attractions.

The 27,443 recreation visits in 2009 were allocated to the five segments using the visit segment shares in Table 2. Since spending is reported for the stay in the area, park entries were converted to trips to the area by dividing by the average number of times each visitor entered the park during their stay. Park re-entry rates were estimated based on the number of entries into the park reported by survey respondents.

Recreation visits were converted to 10,746 visitor group trips by dividing recreation visits by the average visitor group size and park re-entry rate for each segment (Table 3). Person trips for each segment are equal to visitor group trips multiplied by average party size. In 2009, there were 23,763 person trips to the park.

<sup>6</sup> Visitor group size reported herein is based on the number of people covered by expenditures reported in the VSP survey.

**Table 3.** Recreation visits and visitor group trips by segment, 2009

Measure	Segment					All visitors
	Local	Day trip	Motel-out	Camp-out	Other OVN	
Recreation visits	2,933	9,414	10,066	1,713	3,317	27,443
Visitor group trips	890	3,572	4,545	731	1,009	10,746
Percent of visitor group trips*	8%	33%	42%	7%	9%	100%
Person trips	2,877	9,281	9,896	1,501	3,085	23,763

\*Percentages do not equal 100% due to rounding.

### Visitor Spending

The VSP survey covered expenditures of the visitor group inside the park and within 60 miles of the park. Spending averages were computed on a visitor group trip basis for each segment. The average visitor group in 2009 spent \$133 on the trip inside the park and in the local region (Table 4). On a visitor group trip basis, average spending was \$35 for day trips by local residents and \$35 for day trips by non-local visitors. Visitor groups staying in motels, cabins, lodges or B&B's outside the park spent an average of \$227 on their trips and those camping outside the park spent \$159. Visitor groups spent about 5% of their total spending inside the park and 95% outside the park.

**Table 4.** Average spending by segment (\$ per visitor group per trip).

Expenditures	Segment					All visitors*
	Local	Day trip	Motel-out	Camp-out	Other OVN	
<b>Inside Park</b>						
Souvenirs & other expenses	<u>9.90</u>	<u>6.41</u>	<u>6.37</u>	<u>4.95</u>	<u>3.55</u>	<u>6.32</u>
<b>Total Inside Park</b>	<b>9.90</b>	<b>6.41</b>	<b>6.37</b>	<b>4.95</b>	<b>3.55</b>	<b>6.32</b>
<b>Outside Park</b>						
Motel, hotel, cabin or B&B	.00	.00	112.15	.00	.00	47.44
Camping fees	.00	.00	.48	38.06	.00	2.79
Restaurants & bars	6.86	8.80	42.65	17.59	28.47	25.40
Groceries & takeout food	4.20	1.61	7.33	16.89	7.34	5.82
Gas & oil	11.41	13.93	31.82	55.17	27.10	25.33
Local transportation	.00	.37	6.97	1.01	26.01	5.58
Admission & fees	.00	.56	8.85	10.41	4.68	5.08
Souvenirs & other expenses	<u>2.39</u>	<u>3.57</u>	<u>10.77</u>	<u>14.90</u>	<u>25.08</u>	<u>9.30</u>
<b>Total Outside Park</b>	<b>24.86</b>	<b>28.84</b>	<b>221.01</b>	<b>154.02</b>	<b>118.68</b>	<b>126.74</b>
<b>Total Inside &amp; Outside Park</b>	<b>34.77</b>	<b>35.25</b>	<b>227.39</b>	<b>158.97</b>	<b>122.24</b>	<b>133.06</b>

\* Average weighted by percent visitor group trips.

The relative standard error at a 95% confidence level for the overall spending average is 15%. A 95% confidence interval for the overall visitor group spending average is therefore \$133 plus or minus \$18 or between \$115 and \$151.

On a per night basis, visitor groups staying in motels or lodges outside the park spent \$156 in the local region, and campers spent \$106. The average reported per night lodging expense was \$77 for motels outside the park and \$25 for camping fees outside the park (Table 5).

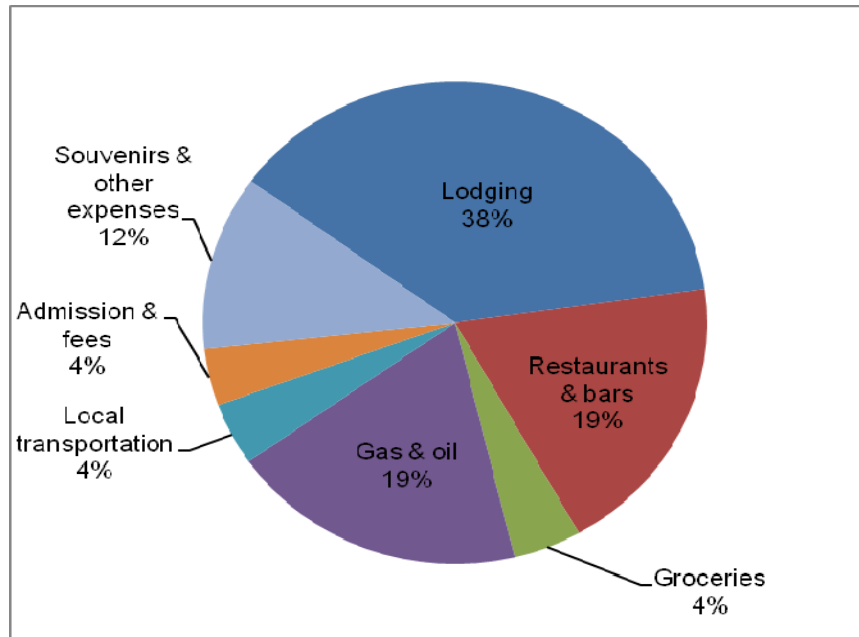
**Table 5.** Average spending per night for visitor groups on overnight trips (\$ per visitor group per night).

<b>Expenditures</b>	<b>Segment</b>		
	<b>Motel-out</b>	<b>Camp-out</b>	<b>Other OVN</b>
Motel, hotel, cabin or B&B	76.90	0.00	0.00
Camping fees	0.33	25.37	0.00
Restaurants & bars	29.25	11.73	12.01
Groceries & takeout food	5.02	11.26	3.09
Gas & oil	21.82	36.78	11.43
Local transportation	4.78	0.67	10.97
Admission & fees	6.07	6.94	1.98
<u>Souvenirs &amp; other expenses</u>	<u>11.75</u>	<u>13.23</u>	<u>12.08</u>
<b>Total per visitor group per night</b>	<b>155.92</b>	<b>105.98</b>	<b>51.57</b>

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. Fort Larned NHS visitors spent a total of \$1.4 million in the local region in 2009 (Table 6). Overnight visitors staying in motels outside the park account for 72% of the total spending. Lodging expenses represent 38% of the total spending, and restaurant and bar expenses and gas and oil expenses each represent 19% (Figure 1).

**Table 6.** Total visitor spending by segment, 2009 (\$000's).

<b>Expenditures</b>	<b>Segment</b>					<b>All visitors</b>
	<b>Local</b>	<b>Day trip</b>	<b>Motel-out</b>	<b>Camp-out</b>	<b>Other OVN</b>	
<b><u>Inside Park</u></b>						
<u>Souvenirs &amp; other expenses</u>	<u>9</u>	<u>23</u>	<u>29</u>	<u>4</u>	<u>4</u>	<u>68</u>
<b>Total Inside Park</b>	<b>9</b>	<b>23</b>	<b>29</b>	<b>4</b>	<b>4</b>	<b>68</b>
<b><u>Outside Park</u></b>						
Motel, hotel, cabin or B&B	0	0	510	0	0	510
Camping fees	0	0	2	28	0	30
Restaurants & bars	6	31	194	13	29	273
Groceries & takeout food	4	6	33	12	7	63
Gas & oil	10	50	145	40	27	272
Local transportation	0	1	32	1	26	60
Admission & fees	0	2	40	8	5	55
<u>Souvenirs &amp; other expenses</u>	<u>2</u>	<u>13</u>	<u>49</u>	<u>11</u>	<u>25</u>	<u>100</u>
<b>Total Outside Park</b>	<b>22</b>	<b>103</b>	<b>1,005</b>	<b>113</b>	<b>120</b>	<b>1,362</b>
<b>Total Inside &amp; Outside Park</b>	<b>31</b>	<b>126</b>	<b>1,034</b>	<b>116</b>	<b>123</b>	<b>1,430</b>
Segment Percent of Total	2%	9%	72%	8%	9%	100%



**Figure 1.** Fort Larned National Historic Site 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-six percent of visitor groups did not make the trip primarily to visit Fort Larned 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 outside the park was counted for day trips. All spending inside the park was treated as park-related spending. With these assumptions, a total of \$1.1 million in visitor spending is attributed to the park visit (Table 7). This represents 76% of the overall visitor spending total.

**Table 7.** Total spending attributed to park visits, 2009 (\$000's).

Expenditures	Segment					All visitors
	Local	Day trip	Motel-out	Camp-out	Other OVN	
Motel, hotel, cabin or B&B	0	0	410	0	0	410
Camping fees	0	0	2	23	0	24
Restaurants & bars	0	24	156	10	17	207
Groceries & takeout food	0	4	27	10	4	45
Gas & oil	0	38	116	33	16	203
Local transportation	0	1	25	1	15	42
Admission & fees	0	2	32	6	3	43
<u>Souvenirs &amp; other expenses</u>	<u>9</u>	<u>10</u>	<u>68</u>	<u>12</u>	<u>18</u>	<u>118</u>
<b>Total Attributed to Park</b>	<b>9</b>	<b>79</b>	<b>837</b>	<b>95</b>	<b>73</b>	<b>1,093</b>
Percent of Spending Attributed to the Park	28%	63%	81%	82%	60%	76%
Percent of Attributed Spending*	1%	7%	77%	9%	7%	100%

\*Percentages do not equal 100% due to rounding.

## Economic Impacts of Visitor Spending

The economic impacts of Fort Larned NHS visitor spending on the local economy are estimated by applying visitor spending to a set of economic ratios and multipliers in MGM2 representing the economy of the fifteen county region.<sup>7</sup> Economic ratios and multipliers for the region were estimated using the *Impact Analysis for Planning (IMPLAN) Professional software* (version 3, MIG, Inc. 2008) with 2008 data.<sup>8</sup> Employment multipliers were adjusted to take into account price changes from 2008 to 2009 (see Study Limitations and Error section below).

Not all visitor spending is 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 are applied to visitor spending to account for mark-ups by retailers and wholesalers. The retail margins for the three sectors are 25.3%, 22.3%, and 50.0%, respectively, and the wholesale margins are 12.3%, 8.3%, and 11.4%. In addition, regional purchase coefficients from IMPLAN for all sectors are 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 generates another \$0.38 in secondary sales through indirect and induced effects.<sup>9</sup> (See Appendix A: Glossary for further explanation of terms.)

Impacts are estimated based first on all visitor spending and then based on the visitor spending attributed to the park. Including all visitor spending accounts for the overall contribution visitors make to the economy of the local region. Including only visitor spending attributable to the park accounts for the impact or contribution the park makes to the economy of the local region.

Using all visitor spending and including direct and secondary effects, the \$1.4 million spent by park visitors supports 26 jobs in the local region and generates \$1.6 million in sales, \$490,000 in labor income and \$829,000 in value added (Table 8).<sup>10</sup>

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 lodging establishments and restaurants.

---

<sup>7</sup> 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.

<sup>8</sup> See Appendix B: Economic Ratios and Multipliers for the region.

<sup>9</sup> 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.

<sup>10</sup> 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, 2009.

<b>Sector/Expenditure category</b>	<b>Sales (\$000's)</b>	<b>Jobs</b>	<b>Labor Income (\$000's)</b>	<b>Value Added (\$000's)</b>
<b>Direct Effects</b>				
Motel, hotel, cabin or B&B	510	9.6	161	292
Camping fees	30	0.5	8	12
Restaurants & bars	273	5.8	82	122
Groceries & takeout food	16	0.3	7	10
Gas & oil	61	0.8	18	42
Local transportation	60	2.3	18	26
Admission & fees	55	0.5	9	16
Souvenirs & other expenses	84	1.6	36	54
Wholesale trade	30	0.4	9	20
<u>Local production of goods</u>	<u>4</u>	<u>0.0</u>	<u>1</u>	<u>1</u>
<b>Total Direct Effects</b>	<b>1,121</b>	<b>21.9</b>	<b>348</b>	<b>596</b>
<u>Secondary Effects</u>	<u>429</u>	<u>4.2</u>	<u>143</u>	<u>233</u>
<b>Total Effects</b>	<b>1,550</b>	<b>26.0</b>	<b>490</b>	<b>829</b>

Note: Impacts of \$1.4 million in visitor spending reported in Table 6.

Using only visitor spending attributable to the park by including only some spending on trips where the primary trip purpose was not to visit Fort Larned NHS reduces the overall impacts by about 23% (Table 9; see spending inclusion assumptions in previous section). Including direct and secondary effects, the \$1.1 million spent by park visitors and attributable to the park generates \$1.2 million in sales, which supports 20 jobs in the local region. These jobs pay \$378,000 in labor income, which is part of \$641,000 in value added to the region.

**Table 9.** Economic impacts of visitor spending attributed to the park, 2009.

<b>Sector/Expenditure category</b>	<b>Sales (\$000's)</b>	<b>Jobs</b>	<b>Labor Income (\$000's)</b>	<b>Value Added (\$000's)</b>
<b>Direct Effects</b>				
Motel, hotel, cabin or B&B	410	7.7	129	235
Camping fees	24	0.4	6	10
Restaurants & bars	207	4.4	62	93
Groceries & takeout food	12	0.2	5	7
Gas & oil	45	0.6	14	31
Local transportation	42	1.7	12	19
Admission & fees	43	0.4	7	13
Souvenirs & other expenses	59	1.1	25	38
Wholesale trade	21	0.3	6	15
<u>Local production of goods</u>	<u>3</u>	<u>0.0</u>	<u>0</u>	<u>1</u>
<b>Total Direct Effects</b>	<b>866</b>	<b>16.8</b>	<b>268</b>	<b>460</b>
<u>Secondary Effects</u>	<u>332</u>	<u>3.2</u>	<u>110</u>	<u>181</u>
<b>Total Effects</b>	<b>1,198</b>	<b>20.1</b>	<b>378</b>	<b>641</b>

Note: Impacts of \$1.1 million in visitor spending attributed to park reported in Table 7.



## **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 by applying economic multipliers to wage and salary data to capture the induced effects of NPS employee spending on local economies. Fort Larned NHS itself employed 17 people in FY 2010 with a total payroll including benefits of \$920,621. Including secondary effects, the local impacts of the park payroll in FY 2009 were \$340,000 in sales, 21 jobs, \$1.0 million in labor income and \$1.1 million total value added (Stynes 2011).

The combined impacts to the region of visitor spending attributable to the park and NPS payroll are \$1.5 million in sales which supports 41 jobs with labor income of \$1.4 million, which is part of a total value added of \$1.7 million.

## **Study Limitations and Errors**

The accuracy of the MGM2 estimates rests on the accuracy of three inputs: visits, spending averages, and multipliers. Visits are taken from NPS Public Use Statistics (2009). 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 trips to the region rather than park entries. Re-entry rates were estimated based on visitor responses to a VSP survey question about the number of times they entered the park.

Spending averages are derived from the 2009 Fort Larned NHS VSP visitor survey (Blotkamp et al. 2010). Estimates from the surveys are subject to sampling errors, measurement errors, and potential seasonal/sampling biases. The overall spending averages are subject to sampling errors 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 was filled with zeros. Visitor groups of more than 8 people (6 cases), visiting the local region for more than 7 nights (3 cases), or spending greater than \$1250 (the mean plus two times the standard deviation of the mean for spending, 1 case) 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 late May and June. To extrapolate to annual totals, it was assumed that this sample represented visitors throughout the year.

Multipliers are 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 2008. It was therefore assumed that most

multipliers have remained stable through 2009. Employment multipliers were adjusted to take into account price changes. Local job to sales ratios were adjusted from 2008 to 2009 based on the percentage changes in national job to sales ratios between 2008 and 2009 and then adjusted to 2009 based on 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 half of visitors to Fort Larned NHS did not make the trip primarily to visit the park and most spending occurred outside the park, adjustments for non-primary purpose trips have a significant effect on the overall spending and impact estimates.

## Literature Cited

Blotkamp, A., E. Papadogiannaki, S.F. Illum, and S.J. Hollenhorst. 2010. Fort Larned National Historic Site Visitor Study. Summer 2009. Visitor Services Project Report #209 Moscow, ID: National Park Service and University of Idaho, Cooperative Park Studies Unit.

BLS (U.S. Bureau of Labor Statistics). 2009. Local Area Unemployment Statistics. <http://www.bls.gov/lau/>. Data retrieved on January 26, 2011.

MIG, Inc. 2008. IMPLAN Professional Version 3.0. Minnesota IMPLAN Group: Stillwater, MN.

National Park Service Public Use Statistics Office. 2009. Visitation Database. <http://www2.nature.nps.gov/stats/>. Data retrieved on July 21, 2010.

Stynes, D. J. 2011. Economic Benefits to Local Communities From National Park Visitation and Payroll, 2009. Natural Resource Report NPS/NRPC/SSD/NRR—2011/281. National Park Service, Fort Collins, Colorado (Benefit estimates updated to FY 2010 on file with author).

Stynes, D. J., D.B. Propst, W. Chang, and Y. Sun. 2007. NPS Money Generation Model – Version 2 (MGM2). <http://web4.canr.msu.edu/mgm2/econ/MGM2Y07.xls> (with price indices updated thru 2009).

USCB (U.S. Census Bureau). 2010. 2005-2009 American Community Survey 5-Year Estimates. <http://www.factfinder.census.gov/>. Data retrieved on January 26, 2011.

## 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. I.e., $\text{Direct jobs} = \text{direct sales} * \text{jobs to sales ratio}$ $\text{Direct personal income} = \text{direct sales} * \text{personal income to sales ratio}$ $\text{Direct value added} = \text{direct sales} * \text{value added to sales ratio}$
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 lodging establishments.
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) by firms within the region to park visitors.

<b>Term</b>	<b>Definition</b>
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"> <li>• Direct effects accrue largely to tourism-related businesses in the area</li> <li>• Indirect effects accrue to a broader set of businesses that serve these tourism firms.</li> <li>• Induced effects are distributed widely across a variety of local businesses.</li> </ul>
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 hotel includes wages and salaries paid to employees, their payroll benefits, profits of the hotel, and sales, property, and other indirect business taxes. The hotel's non-labor operating costs such as purchases of supplies and services from other firms are not included as value added by the hotel.
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: Economic Multipliers and IMPLAN Sectors

**Table B1.** Economic ratios and multipliers for selected tourism-related sectors, Fort Larned NHS region, 2009.

Sector	Direct effects			Total effects multipliers				
	Jobs / \$MM sales	Income / sales	Value added / sales	Sales I	Sales SAM	Jobs II / MM sales	Income II / sales	Value added II / sales
Motel, hotel, cabin or B&B	18.82	0.32	0.57	1.21	1.40	22.97	0.45	0.79
Camping fees	16.45	0.26	0.39	1.29	1.47	21.32	0.42	0.65
Restaurants & bars	21.25	0.30	0.45	1.19	1.36	24.78	0.42	0.65
Groceries & takeout food	16.91	0.42	0.64	1.16	1.40	20.97	0.55	0.86
Gas & oil	13.84	0.30	0.69	1.14	1.31	17.01	0.40	0.87
Local transportation	39.03	0.29	0.44	1.15	1.32	42.39	0.40	0.62
Admission & fees	9.53	0.17	0.30	1.27	1.40	13.60	0.30	0.51
Souvenirs & other expenses	18.95	0.43	0.64	1.16	1.39	23.00	0.56	0.87
Local production of goods	6.84	0.22	0.28	1.12	1.25	9.22	0.30	0.42
Wholesale trade	7.27	0.37	0.63	1.16	1.37	11.06	0.49	0.84

Source: IMPLAN (MIG, Inc. 2008).

### 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 hotel sector row to illustrate

**Direct Effects:** Every million dollars in hotel sales creates 18.8 jobs in hotels. Thirty-two percent of hotel sales goes to wages and salaries of hotel employees and 57% of hotel sales is value added. That means 43% of hotel sales goes to purchase inputs by hotels. The wage and salary income creates the induced effects and the 43% spent on purchases by the hotel starts the rounds of indirect effects.

**Multiplier effects:** There is an additional 21 cents of indirect sales in the region for every dollar of direct hotel sales (type I sales multiplier = 1.21). Total secondary sales are 40 cents per dollar of direct sales, which means 21 cents in indirect effects and 19 cents in induced effects. An additional 4.2 jobs are created from secondary effects of each million dollars in hotel sales (23.0

total jobs – 18.8 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 hotel sales are 13% (45%-32%), and the secondary effects on value added for each dollar of hotel sales are 22% (79%-57%). Including secondary effects, every million dollar of hotel sales in the region yields \$1.40 million in sales, \$450,000 in income, and \$790,000 in value added.

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

<b>MGM sector</b>	<b>IMPLAN</b>		<b>2007 NAICS</b>
	<b>No.</b>	<b>Name</b>	
Motel, hotel, cabin or B&B	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
Admission & fees	410	Other amusement and recreation industries	71391-3, 71399
Souvenirs & other expenses	329	Retail - General merchandise	452
Local production of goods	317	All other miscellaneous manufacturing	339993, 339995, 339999
Wholesale trade	319	Wholesale trade	42

Source: IMPLAN (MIG, Inc. 2008).

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

NPS 425/110069, April 2011

**National Park Service**  
**U.S. Department of the Interior**



---

**Natural Resource Stewardship and Science**  
1201 Oakridge Drive, Suite 150  
Fort Collins, CO 80525

[www.nature.nps.gov](http://www.nature.nps.gov)

**EXPERIENCE YOUR AMERICA™**