

Impacts of Visitor Spending on the Local Economy: Lava Beds National Monument, 2007



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Executive Summary

Lava Beds National Monument (NM) hosted 102,629 recreation visits in 2007. Based on the 2007 visitor survey 15% of the visitors are local residents, 40% are visitors from outside the local area not staying overnight within 60 miles of the park, and 45% are visitors staying overnight in the local area. Half of the overnight visitors are staying in motels, while the other half are staying with friends or relatives, campgrounds or unpaid lodging.

The average visitor party (average party size was 2.7) spent \$119 in the local area on the trip. Visitors reported expenditures of their group inside the park and within a 60 mile radius of the park. On a party trip basis, average spending in 2007 was \$25 for local residents, \$58 for non-local day trips, \$289 for visitors in motels, \$127 for campers, and \$173 for other overnight visitors. On a per night basis, visitors staying in motels spent \$180 in the local region compared to \$79 for other overnight visitors. The average per night lodging cost was \$87 per night for visitors staying in motels.

Total visitor spending in 2007 within 100 miles of the park was \$3.6 million. Overnight visitors staying in motels, cabins or B&B's accounted for 51% of the total spending. Twenty-seven percent of the spending was for lodging, 15% for restaurant meals and bar expenses, 26% for gas and oil, and 11% for groceries.

Roughly 60% of the visitors indicated the park visit was the primary reason for coming to the area. Only a portion of the expenses for non-primary purpose trips can be attributed to the park visit. Omitting spending by local visitors and reducing spending attributed to the park visit for visitors in the area for other reasons yields a total of \$2.77 million in spending attributed to the park, representing 77% of the total spent by park visitors in the area on the trip.

The economic impact of park visitor spending is estimated by applying this spending to a model of the local economy. The local region was defined to encompass Siskiyou and Modoc counties in California and Klamath county in Oregon. The tourism spending sales multiplier for the region is 1.48.

Visitor spending in 2007 that can be attributed to the park visit supported 40 jobs in the area outside the park, generating over a million dollars in labor income and \$1.6

million in value added. Value added includes wages and salaries as well as profits and rents to area businesses and also sales taxes.

The park itself employed 37 people in FY 2007 with a total payroll including benefits of \$1.88 million. Including secondary effects, the local impact of the park payroll in 2007 was 51 jobs, \$2.30 million in labor income and \$2.64 million total value added.

Including both visitor spending and park operations, the total impact of the park on the local economy in 2007 was 91 jobs and \$4.25 million value added. Park operations account for 56% of the employment effects and 62% of value added.

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Introduction

The purpose of this study is to document the local economic impacts of visitors to Lava Beds National Monument (NM) in 2007. Economic impacts are measured as the direct and secondary sales, income and jobs in the local area resulting from spending by park visitors. The economic estimates are produced using the Money Generation Model 2 (MGM2) (Stynes and Propst, 2000). Three major 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 Lava Beds NM Visitor Survey, National Park Service Public Use Statistics, and IMPLAN input-output modeling software. The MGM2 model provides a spreadsheet template for combining park use, spending and regional multipliers to compute changes in sales, personal income, jobs and value added in the region.

Lava Beds NM and the Local Region

Lava Beds NM is located in northern California about 30 miles south of Klamath Falls, OR. The park hosted 102,629 recreation visitors in 2007 (Table 1). Park campgrounds provided 11,604 overnight stays in 2007.

The local region was defined as a three county area covering Siskiyou and Modoc counties in California and Klamath county in Oregon. This region roughly coincides with the 60 mile radius of the park for which visitor spending was reported in the visitor survey. The region has a population of 118,000 people.

Lava Beds NM Visitor Survey, 2007

A park visitor study was conducted at Lava Beds NM from May 25-June 8, 2007 (Holmes, Eury and Hollenhorst, 2008). The study measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a sample of 340 visitors. Visitors returned 223 questionnaires for a 66% response rate. Data generated

through the visitor survey were used as the basis to develop the spending profiles, segment shares and trip characteristics for Lava Beds NM visitors.

Table 1. Recreation Visits to Lava Beds NM, 2006-7

Month	2006	2007
January	2,613	2,868
February	3,906	3,846
March	4,197	3,937
April	4,914	5,163
May	10,495	10,485
June	14,223	14,955
July	17,178	16,879
August	14,939	15,643
September	11,814	13,391
October	10,791	5,864
November	5,784	6,938
<u>December</u>	<u>3,636</u>	<u>2,660</u>
Total	104,490	102,629

Source: NPS Public Use Statistics

MGM2 Visitor Segments

MGM2 divides visitors into segments to help explain differences in spending across distinct user groups. Five segments were established for Lava Beds NM visitors:

Local day users: Day visitors who reside within the local region,

Non-local day users: Visitors from outside the region, not staying overnight in the area. This includes day trips as well as pass-through travelers, who may be staying overnight on their trip outside the region.

Camp-in : Visitors camping inside the park.

Motel: Visitors staying in motels, hotels, cabins, or B&B's within 100 miles of the park

Other OVN: Other visitors staying overnight in the area with friends or relatives including overnight visitors not reporting any lodging expenses

The 2007 visitor survey was used to estimate the percentage of visitors from each segment as well as spending averages, lengths of stay and party sizes for each segment. Fifteen percent of the visitors are local residents, 40% are visitors from outside the local area not staying overnight within the local area, and 45% are visitors staying overnight within 100 miles of the park.

About half of the overnight visitors are staying in motels, cabins or B&B's, 18% are camping in the park, and 31% are staying with friends or relatives or other unpaid lodging (Table 2). The average spending party size was 2.7 people. Visitors in motels averaged 1.6 nights in the area, while park campers and other overnight visitors averaged 2.2 nights.

Local residents were assumed to be making the trip primarily to visit the park. Half of the non-local visitors came to the area primarily to visit the Lava Beds NM. Fourteen percent of visitors came to visit other attractions in the area; 23% were passing through and 5% percent were visiting friends or relatives in the area.

Table 2. Selected Visit/Trip Characteristics by Segment, 2007

Characteristic	Local	Day trip	Camp-In	Motel	Other OVN	Total
Segment share (survey)	12%	29%	17%	26%	16%	100%
Segment share (adjusted)	15%	40%	8%	23%	14%	100.0%
Average Party size	2.3	3.0	2.7	2.6	2.6	2.7
Length of stay (days/nights)	1.0	1.0	2.2	1.6	2.2	1.4
Re-entry rate	1.3	1.0	1.5	1.5	1.5	1.3
Percent primary purpose trips	100%	50%	84%	44%	42%	59%

The 102,629 recreation visits in 2007 were allocated to the five segments using the adjusted segment shares in Table 2. Based on overnight stay figures, the percentage of visitors camping in the park was reduced from the visitor survey percentage and reallocated primarily to local visits and day trips. Recreation visits are converted to 30,487 party trips by dividing by the average party size and re-entry rates for each segment (Table 3).

Table 3. Recreation Visits and Party Trips by Segment, 2007

Measure	Local	Day trip	Camp-In	Motel	Other OVN	Total
Recreation visits	15,394	41,052	8,210	23,605	14,368	102,629
Party visits/trips	5,350	13,249	2,006	6,268	3,552	30,425
Person trips	12,096	39,748	5,368	16,135	9,339	82,686
Percent of party trips	18%	44%	7%	21%	12%	100%
Party nights	5,350	13,249	4,325	10,078	7,715	40,718

Visitor spending

Spending averages were computed on a party trip basis for each segment. The survey covered expenditures of the travel party within a 60 mile radius of the park. The average visitor party spent \$119 in the local area¹. On a party trip basis, average spending in 2007 was \$25 for local residents, \$58 for non-local day trips, \$127 for campers, \$289 for visitors staying in motels, and \$173 for other overnight visitors (Table 4).

¹ The average of \$119 is lower than the \$206 spending average in the VSP report (Holmes, Eury , and Hollenhorst 2008) due to the omission of outliers, treatment of missing spending data, and adjustments of the segment mix to be consistent with overnight stay figures.

Table 4. Average Visitor Spending by Segment (\$ per party per trip)

	Local	Day trip	Camp-In	Motel	Other OVN	Total
In Park						
Souvenirs	1.84	6.70	9.06	4.59	6.04	5.49
Admissions, fees, guide	3.20	4.54	6.09	5.18	5.00	4.59
Camp	0.00	0.00	20.35	0.00	0.00	1.34
Groceries, take-out food/drinks	0.25	0.86	2.12	0.66	1.35	0.85
In Community						0.00
Motel, hotel cabin or B&B	0.00	0.00	13.82	140.27	0.00	30.43
Camping fees	0.00	0.00	0.00	0.85	11.27	1.46
Restaurants & bars	0.80	5.87	11.47	57.38	23.17	18.16
Groceries, take-out food/drinks	5.80	6.41	16.98	15.81	34.00	12.11
Gas & oil	10.14	26.30	39.79	44.64	51.87	31.12
Local transportation	2.40	1.23	2.94	8.91	31.67	6.62
Admissions & fees	0.40	3.33	1.47	6.18	2.33	3.18
<u>Souvenirs and other expenses</u>	<u>0.00</u>	<u>3.07</u>	<u>3.38</u>	<u>4.91</u>	<u>6.00</u>	<u>3.27</u>
Grand Total	24.83	58.30	127.48	289.39	172.69	118.62
Total in park	5.29	12.11	37.62	10.43	12.39	12.27
Total Outside park	19.54	46.20	89.87	278.96	160.30	106.35

On a per night basis, visitors staying in motels spent \$180 in the local region compared to \$59 for campers and \$79 for other overnight visitors. The average per night lodging cost was \$87 per night for visitors staying in motels and \$9.44 for campers.

The sampling error (95% confidence level) for the overall spending average is 16%. A 95% confidence interval for the spending average is therefore \$119 plus or minus \$18 or (\$101, \$137).

Table 5. Average Spending per Night for Visitors on Overnight Trips (\$ per party per night)

Spending Category	Camp-In	Motel	Other OVN
Motel, hotel cabin or B&B	6.41	87.24	0.00
Camping fees	9.44	0.53	5.19
Restaurants & bars	5.32	35.69	10.66
Groceries, take-out food/drinks	8.86	10.25	16.27
Gas & oil	18.46	27.76	23.88
Local transportation	1.36	5.54	14.58
Admissions & fees	3.51	7.07	3.38
<u>Souvenirs and other expenses</u>	<u>5.77</u>	<u>5.91</u>	<u>5.54</u>
Grand Total	59.12	179.99	79.49

Lava Beds NM visitors spent a total of \$3.59 million in the local area in 2007 (Table 6). Total spending was estimated by multiplying the number of party trips for each segment by the average spending per trip and summing across segments.

Overnight visitors staying in motels, cabins or B&B's accounted for 51% of the total spending. Twenty-seven percent of the spending was for lodging, 15% for restaurant meals and bar expenses, 26% for gas and oil, and 11% for groceries.

Not all of this spending would be lost to the region in the absence of the park as only half of non-local visitors came to the area primarily to visit the park. Spending directly attributed to the park visit was estimated by counting all spending for trips where the park was the primary reason for the trip. Half of the spending outside the park was counted for day trips if the trip was not made primarily to visit Lava Beds NM. The equivalent of one night of spending was attributed to the park visit for overnight trips made to visit other attractions, friends or relatives or on business.² All spending inside the park was counted, but all spending by local visitors outside the park was excluded.

These attributions yield a total of \$2.77 million in visitor spending attributed to the park visit, representing 77% of the overall visitor spending total (Table 7).

Table 6. Total Visitor Spending by Segment, 2007 (\$000s)

	Local	Day trip	Camp-In	Motel	Other OVN	Total
In Park						
Souvenirs	10	89	18	29	21	167
Admissions & fees	17	60	12	32	18	140
Camp	0	0	41	0	0	41
Groceries, take-out food/drinks	1	11	4	4	5	26
In Community						
Motel, hotel cabin or B&B	0	0	28	879	0	907
Camping fees	0	0	0	5	40	45
Restaurants & bars	4	78	23	360	82	547
Groceries, take-out food/drinks	31	85	34	99	121	370
Gas & oil	54	348	80	280	184	946
Local transportation	13	16	6	56	112	203
Admissions & fees	2	44	3	39	8	96
<u>Souvenirs and other expenses</u>	<u>0</u>	<u>41</u>	<u>7</u>	<u>31</u>	<u>21</u>	<u>99</u>
Grand Total	133	772	256	1,814	613	3,588
Total excluding park admissions	116	712	243	1,781	596	3,449
Segment Percent of Total	4%	22%	7%	51%	17%	100%

² This assumes that these visitors spent an extra night in the area to visit Lava Beds NM.

Table 7. Total Spending Attributed to Park Visits, 2007 (\$000s)

	Local	Day trip	Camp-In	Motel	Other OVN	Total
In Park						
Souvenirs	10	89	18	29	21	167
Admissions & fees	17	60	12	32	18	140
Camping fees	0	0	41	0	0	41
Groceries, take-out food/drinks	1	11	4	4	5	26
In Community						
Motel, hotel cabin or B&B		0	25	693	0	719
Camping fees		0	0	4	27	32
Restaurants & bars		58	21	284	56	419
Groceries, take-out food/drinks		64	31	78	83	256
Gas & oil		261	73	221	126	681
Local transportation		12	5	44	77	139
Admissions & fees		33	3	31	6	72
Souvenirs and other expenses		30	6	24	15	76
Total Attributed to Park	28	619	240	1,444	434	2,766
Excluding park admissions	11	559	228	1,412	416	2,626
Percent of spending attributed to the park	21%	80%	94%	80%	71%	77%
Percent of attributed spending	1%	22%	9%	52%	16%	100%

Economic Impacts of Visitor Spending

The economic impacts of Lava Beds NM visitor spending on the local economy are estimated by applying the spending attributed to the park (Table 7) to a set of economic ratios and multipliers representing the local economy. Multipliers for the region were estimated with the IMPLAN system using 2001 data. The tourism sales multiplier for the region is 1.48. Every dollar of direct sales to visitors generates another \$.48 in secondary sales through indirect and induced effects³.

Impacts are estimated based on the visitor spending attributed to the park in Table 7. Including direct and secondary effects, the \$2.77 million spent by park visitors⁴ supports 40 jobs in the area and generates \$2.72 million in sales, \$1.07 million in labor income and \$1.62 million in value added (Table 8).

³ 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.

⁴ Revenues received by the park (park admissions and donations) are excluded in estimating visitor spending impacts as the impacts resulting from park revenues are covered as part of park operations.

Labor income covers wages and salaries, including payroll benefits. Value added is the preferred measure of the contribution 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.

Table 8. Economic Impacts of Visitor Spending Attributed to the Park, 2007.

Sector/Spending category	Sales \$000's	Jobs	Labor Income \$000's	Value Added \$000's
Direct Effects				
Motel, hotel cabin or B&B	735	9	321	521
Camping fees	72	1	11	26
Restaurants & bars	425	8	188	213
Admissions & fees	73	2	27	45
Local transportation	138	3	67	76
Grocery stores	71	1	30	40
Gas stations	152	1	67	87
Other retail	121	2	58	81
Wholesale Trade	42	2	20	23
<u>Local Production of goods</u>	<u>3</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Direct Effects	1,831	30	788	1,110
<u>Secondary Effects</u>	<u>886</u>	<u>10</u>	<u>286</u>	<u>507</u>
Total Effects	2,717	40	1,074	1,616

Impacts of the NPS Park Payroll

The park itself employed 37 people in FY 2007 with a total payroll including benefits of \$1.88 million. Including secondary effects, the local impact of the park payroll in 2007 was 51 jobs, \$2.30 million in labor income and \$2.64 million total value added. Including both visitor spending and park operations, the total impact of the park on the local economy in 2007 was 91 jobs and \$4.25 million value added. Park operations account for 56% of the employment effects and 62% of value added.

Study Limitations and Error

The accuracy of the MGM2 estimates rests on the accuracy of the three inputs: visits, spending averages, and multipliers. Recreation visit estimates rely on counting procedures at the park, which may miss some visitors and count others more than once during their visit.

Spending averages are derived from the 2007 Lava Beds NM Visitor Survey. Estimates from the survey are subject to sampling errors, measurement errors and seasonal/sampling biases. The overall spending average is subject to sampling errors of 16%.

Spending averages are also sensitive to decisions about outliers and treatment of missing data. To carry out the analysis incomplete spending data had to be completed and decisions had to be made about the handling of missing spending data and zero spending reports. Conservative assumptions were adopted (See Appendix B for details).

As the sample only covers visitors during a single week, we must assume these visitors (after adjustments for the segment mix) are representative of visitors during the rest of the year to extrapolate to annual totals. Adjustments are made to the segment mix to reflect fewer campers during the off-seasons.

Multipliers are derived from an input-output model of the local economy using IMPLAN. The local model was estimated with 2001 IMPLAN county data. Employment estimates were adjusted to 2007 based on changes in sales to employment ratios for each economic sector between 2001 and 2007. Input-output models rest on a number of assumptions, however, errors due to the multipliers will be small compared to potential errors in visit counts and spending estimates.

Sorting out the contribution of the park in attracting visitors on multi-purpose or multi-destination trips is inherently difficult. As the park was not the primary reason for the trip to the region for all visitors, some of the spending would likely not be lost in the absence of the park. The procedures for attributing spending to the park are somewhat subjective, but reasonable. They result in 77% of all visitor spending being attributed to park visits.

REFERENCES

- Holmes, N., Eury, D., and Hollenhorst, S.J. (2008). Lava Beds National Monument Visitor Study. Summer 2007. Visitor Services Project Report #187 Moscow, ID: National Park Service and University of Idaho, Cooperative Park Studies Unit.
- National Park Service Public Use Statistic Office. (2006). Visitation DataBase. <http://www2.nature.nps.gov/stats/>. Data retrieved on March 30, 2008.
- Stynes, D. J., Propst, D.B., Chang, W. and Sun, Y. (2000). Estimating national park visitor spending and economic impacts: The MGM2 model. May, 2000. Final report to National Park Service. East Lansing, Michigan: Department of Park, Recreation and Tourism Resources, Michigan State University.

Appendix A: Definitions of Economic Terms

Term	Definition
Sales	Sales of firms within the region to park visitors.
Jobs	The number of jobs in the region supported by the visitor spending. Job estimates are not full time equivalents, but include part time positions.
Personal income	Wage and salary income, sole proprietor's income and employee payroll benefits.
Value added	Personal income plus rents and profits 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 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.
Direct effects	Direct effects are the changes in sales, income and jobs in those business or agencies that directly receive the visitor spending.
Secondary effects	These are the changes in the economic activity in the region that result from the re-circulation of the money spent by visitors. Secondary effects include indirect and induced effects.
Indirect effects	Changes in sales, income and jobs in industries that supply goods and services to the businesses that sell directly to the visitors. 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 the 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.
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.

Appendix B: Handling of Missing Spending Data and Outliers

To compute spending averages and to sum spending across categories, spending categories with missing spending data had to be filled. If spending was reported in any category, the remaining categories were assumed to be zero. This yielded 193 cases with valid spending data, 18 cases reporting zero spending and 12 cases not completing the spending question. Cases with zero or missing spending data are local residents, day trips, or other overnight visitors. It was assumed that these cases spent no money related to their park visit in the local area.

Table B-1. Valid, Zero and Missing Spending Data by Segment

	Local	Day trip	Camp-In	Motel	Other OVN	Total
Report some spending	18	52	37	59	27	193
Missing spending data	4	2	0	0	6	12
<u>Zero spending</u>	<u>4</u>	<u>11</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>18</u>
Total cases	26	65	37	59	36	223
Percent zero	15%	17%	0%	0%	8%	8%
Percent missing	15%	3%	0%	0%	17%	5%

Eighteen cases were omitted from the spending analysis due to long stays, large parties or high spending. Twelve cases reporting party sizes greater than 7 were omitted, as were five cases reporting more than \$1,000 in expenses. One case reported a length of stay of 30 nights. These omissions significantly reduce the spending averages for campers and motel users.

Table B-2. Spending Averages by Segment, with and without outliers

Segment	With outliers			Without outliers			Pct Error ^a
	Mean	N	Std. Deviation	Mean	N	Std. Deviation	
Local	26	26	37	25	25	37	59%
Day trip	55	65	76	58	61	77	33%
Camp-In	203	37	311	127	34	142	37%
Motel	388	59	437	289	55	155	14%
<u>Other OVN</u>	<u>156</u>	<u>36</u>	<u>196</u>	<u>173</u>	<u>30</u>	<u>208</u>	<u>43%</u>
Total (weighted)	180	223	304	144	205	166	16%

a. Pct errors computed at a 95% confidence level

Appendix C. Impacts of all Visitor Spending, 2007

Table C1 gives the impacts of all \$3.59 million in visitor spending on the local economy. All visitor spending in the region except donations is included in this analysis. Impacts including all visitor spending are roughly 30% higher than those reported in Table 8, which counts only spending directly attributable to the park visits.

Table C-1. Impacts of all Visitor Spending on the Local Economy, 2007

Sector/Spending category	Sales \$000's	Jobs	Labor	Value Added \$000's
Direct Effects				
Motel, hotel cabin or B&B	928	12	405	657
Camping fees	85	1	13	31
Restaurants & bars	554	10	246	277
Admissions & fees	97	3	36	60
Local transportation	202	5	98	111
Grocery stores	100	2	42	56
Gas stations	212	2	92	121
Other retail	133	3	63	89
Wholesale Trade	55	2	27	30
<u>Local Production of goods</u>	<u>4</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Direct Effects	2,369	39	1,022	1,431
<u>Secondary Effects</u>	<u>1,148</u>	<u>13</u>	<u>371</u>	<u>657</u>
Total Effects	3,518	51	1,393	2,088