

# Impacts of Visitor Spending on the Local Economy: Agate Fossil Beds National Monument, 2007



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## **Executive Summary**

Agate Fossil Beds National Monument (NRA) hosted 12,997 recreation visits in 2007. Based on the 2007 visitor survey 4% of the visitors are local residents, 14% are visitors from outside the local area not staying overnight within 100 miles of the park, and 82% are visitors staying overnight in the local area. Fifty-six percent of overnight visitors are staying in motels and 44% are staying with friends or relatives, campgrounds or unpaid lodging.

The average visitor party (average party size was 2.9) spent \$180 in the local area. Visitors reported expenditures of their group inside the park and within 100 miles of the park. On a party trip basis, average spending in 2007 was \$36 for local residents, \$34 for non-local day trips, \$300 for visitors in motels, and \$101 for other overnight visitors. On a per night basis, visitors staying in motels spent \$188 in the local region compared to \$49 for other overnight visitors. The average per night lodging cost was \$85 per night for visitors staying in motels.

Total visitor spending in 2007 within 100 miles of the park was \$796,000. Overnight visitors staying in motels, cabins or B&B's accounted for 77% of the total spending. Thirty-seven percent of the spending was for lodging, 18% for restaurant meals and bar expenses, 21% for gas and oil, and 7% for souvenirs.

Only 20% of the non-local 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 \$543,000 in spending attributed to the park, about 68% 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 Box Butte, Dawes, Morrill, Scotts Bluff and Sioux counties in Nebraska. The tourism spending sales multiplier for the region is 1.41.

Visitor spending in 2007 that can be attributed to the park visit supported 11 jobs in the area outside the park, generating \$225,000 in labor income and \$345,000 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 10 people in FY 2007 with a total payroll including benefits of \$433,000. Including secondary effects, the local impact of the park payroll in 2007 was 13 jobs, \$503,000 in labor income and \$555,000 total value added.

Including both visitor spending and park operations, the total impact of the park on the local economy in 2007 was 24 jobs and \$900,000 value added. Park operations account for 54% 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 Agate Fossil Beds National Monument (NB) 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 Agate Fossil 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.

## **Agate Fossil Beds NM and the Local Region**

Agate Fossil Beds NM is located in western Nebraska about an hour's drive north of Scotts Bluff. The park hosted 13,000 recreation visitors in 2007 (Table 1).

The local region was defined as a five county area covering Box Butte, Dawes, Morrill, Scotts Bluff and Sioux counties, NB. This region roughly coincides with the 100 mile radius of the park for which visitor spending was reported in the visitor survey. The region has a population of 64,000 people.

## **Agate Fossil Beds NM Visitor Survey, 2007**

A park visitor study was conducted at Agate Fossil Beds NM from July 7-August 3, 2007 (Holmes, Schuette and Hollenhorst, 2008). The study measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a sample of 340 visitors. Visitors returned 273 questionnaires for a 80% response rate. Data

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

**Table 1. Recreation Visits to Agate Fossil Beds NM, 2006-7**

<b>Month</b>	<b>2006</b>	<b>2007</b>
January	211	<b>140</b>
February	84	110
March	235	324
April	503	635
May	1,468	1,935
June	2,743	2,209
July	2,930	2,984
August	2,428	2,027
September	1,648	1,450
October	759	646
November	340	411
<u>December</u>	<u>172</u>	<u>126</u>
<b>Total</b>	<b>13,521</b>	<b>12,997</b>

Source: NPS Public Use Statistics

## **MGM2 Visitor Segments**

MGM2 divides visitors into segments to help explain differences in spending across distinct user groups. Four segments were established for Agate Fossil 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.
- 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. Four percent of the visitors are local residents, 14% are visitors from outside the local area not staying overnight within the local area, and 82% are visitors staying overnight within 100 miles of the park. Fifty-six percent of the overnight visitors are staying in motels, cabins or B&B's, while 44% are staying with friends or relatives, campgrounds or other unpaid lodging (Table 2)<sup>1</sup>. The average spending party size was three people.

<sup>1</sup> These percentages vary slightly from the VSP report (Holmes, Schuett and Hollenhorst. 2008) as some visitors listing motels or campgrounds as lodging types did not report any lodging expenses and are classified here in the other OVN category.

Local residents were assumed to be making the trip primarily to visit the park. Only 20% of visitors stated that visiting Agate Fossil Beds NM was the primary reason for the trip. Forty percent were passing through and 25% were visiting other attractions in the area.

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

Characteristic	Local	Day trip	Motel	Other OVN	Total
Segment share	4%	14%	46%	36%	100%
Average Party size	3.3	2.7	3.0	3.0	2.9
Length of stay (days/nights)	1.0	1.0	1.6	2.0	1.6
Percent primary purpose trips	100%	13%	15%	17%	20%

Agate Fossil Beds NM hosted 13,000 recreation visitors in 2007. Recreation visits were allocated to the four segments using the segment shares in Table 2. These visits are converted to 4,432 party trips by dividing by the average party size for each segment (Table 3).

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

Measure	Local	Day trip	Motel	Other OVN	Total
Recreation visits	571	1,761	5,999	4,666	12,997
Party visits/trips	176	663	2,032	1,561	4,432
Person trips	571	1,761	5,999	4,666	12,997
Percent of party trips	4%	15%	46%	35%	100%
Party nights	176	663	3,242	3,199	7,280

## Visitor spending

Spending averages were computed on a party trip basis for each segment. The survey covered expenditures of the travel party within a 100 mile radius of the park. The average visitor party spent \$180 in the local area<sup>2</sup>. On a party trip basis, average spending in 2007 was \$36 for local residents, \$34 for non-local day trips, \$300 for visitors in motels, and \$101 for other overnight visitors (Table 4).

<sup>2</sup> The average of \$180 is lower than the \$215 spending average in the VSP report (Holmes, Schuette, and Hollenhorst 2008) due to the omission of outliers and treatment of missing spending data.

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

	Local	Day trip	Motel	Other OVN	Total
<b>In Park</b>					
Souvenirs	12.92	5.53	7.03	5.06	6.35
<b>In Community</b>					0.00
Motel, hotel cabin or B&B	0.00	0.00	135.12	0.00	61.96
Camping fees	0.00	0.00	0.70	16.16	6.02
Restaurants & bars	3.75	5.43	54.70	15.82	31.61
Groceries, take-out food/drinks	2.50	3.49	12.03	14.05	11.08
Gas & oil	13.42	14.31	48.74	36.06	37.72
Local transportation	0.00	1.43	0.89	0.93	0.95
Admissions & fees	0.42	0.91	17.85	6.23	10.53
<u>Souvenirs and other expenses</u>	<u>2.83</u>	<u>2.74</u>	<u>22.74</u>	<u>7.10</u>	<u>13.45</u>
<b>Grand Total</b>	<b>35.83</b>	<b>33.84</b>	<b>299.80</b>	<b>101.42</b>	<b>179.68</b>
Total in park	12.92	5.53	7.03	5.06	6.35
Total Outside park	22.92	28.31	292.77	96.36	173.33

On a per night basis, visitors staying in motels spent \$188 in the local region compared to \$50 for other overnight visitors. The average per night lodging cost was \$85 per night for visitors staying in motels.

The sampling error (95% confidence level) for the overall spending average is 15%. A 95% confidence interval for the spending average is therefore \$180 plus or minus \$28 or (\$152, \$208).

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

	Motel	Other OVN
Motel, hotel cabin or B&B	84.71	0.00
Camping fees	0.44	7.89
Restaurants & bars	34.29	7.72
Groceries, take-out food/drinks	7.54	6.85
Gas & oil	30.56	17.59
Local transportation	0.56	0.46
Admissions & fees	11.19	3.04
<u>Souvenirs and other expenses</u>	<u>18.67</u>	<u>5.93</u>
<b>Grand Total</b>	<b>187.96</b>	<b>49.49</b>

Agate Fossil Beds NM visitors spent a total of \$796,000 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 77% of the total spending. Thirty-seven percent of the spending was for lodging, 18% for restaurant meals and bar expenses, 21% for gas and oil, and 7% for souvenirs.

Not all of this spending would be lost to the region in the absence of the park as only 20% 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 Agate Fossil 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.<sup>3</sup> All spending inside the park was counted, but all spending by local visitors outside the park was excluded.

These attributions yield a total of \$543,000 in visitor spending attributed to the park visit, representing 68% of the overall visitor spending total (Table 7).

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

	Local	Day trip	Motel	Other OVN	Total
<b>In Park</b>					
Souvenirs	2.27	3.67	14.29	7.90	28.13
<b>In Community</b>					
Motel, hotel cabin or B&B	0.00	0.00	274.61	0.00	274.61
Camping fees	0.00	0.00	1.43	25.23	26.66
Restaurants & bars	0.66	3.60	111.16	24.70	140.12
Groceries, take-out food/drinks	0.44	2.31	24.45	21.93	49.13
Gas & oil	2.36	9.49	99.06	56.29	167.20
Local transportation	0.00	0.95	1.80	1.46	4.21
Admissions & fees	0.07	0.61	36.27	9.73	46.68
<u>Souvenirs and other expenses</u>	<u>0.50</u>	<u>1.82</u>	<u>46.22</u>	<u>11.08</u>	<u>59.62</u>
<b>Grand Total</b>	<b>6</b>	<b>22</b>	<b>609</b>	<b>158</b>	<b>796</b>
Segment Percent of Total	1%	3%	77%	20%	100%

<sup>3</sup> This assumes that these visitors spent an extra night in the area to visit Agate Fossil Beds NM.



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

	Local	Day trip	Motel	Other OVN	Total
<b>In Park</b>					
Souvenirs	2	4	14	8	28
<b>In Community</b>					
Motel, hotel cabin or B&B		0	188	0	188
Camping fees		0	1	15	15
Restaurants & bars		2	76	14	92
Groceries, take-out food/drinks		1	17	13	31
Gas & oil		5	68	32	106
Local transportation		1	1	1	3
Admissions & fees		0	25	6	31
<u>Souvenirs and other expenses</u>		<u>1</u>	<u>39</u>	<u>10</u>	<u>50</u>
<b>Total Attributed to Park</b>	<b>2</b>	<b>14</b>	<b>429</b>	<b>98</b>	<b>543</b>
Percent of spending attributed to the park	36%	64%	70%	62%	68%
Percent of attributed spending	0%	3%	79%	18%	100%

### **Economic Impacts of Visitor Spending**

The economic impacts of Agate Fossil 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 1.41. Every dollar of direct sales to visitors generates another \$ .41 in secondary sales through indirect and induced effects<sup>4</sup>.

Impacts are estimated based on the visitor spending attributed to the park in Table 7. Including direct and secondary effects, the \$543,000 spent by park visitors supports 11 jobs in the area and generates \$583,000 in sales, \$225,000 in labor income and \$345,000 in value added (Table 8).

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.

<sup>4</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.

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

<b>Sector/Spending category</b>	<b>Sales \$000's</b>	<b>Jobs</b>	<b>Labor Income \$000's</b>	<b>Value Added \$000's</b>
Motel, hotel cabin or B&B	188	5	82	133
Camping fees	15	0	0	0
Restaurants & bars	92	2	36	41
Admissions & fees	31	1	11	19
Local transportation	3	0	1	2
Grocery stores	8	0	3	4
Gas stations	24	0	9	12
Other retail	39	1	18	25
Wholesale Trade	15	0	8	9
<u>Local Production of goods</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>
<b>Total Direct Effects</b>	<b>415</b>	<b>9</b>	<b>170</b>	<b>245</b>
<u>Secondary Effects</u>	<u>168</u>	<u>2</u>	<u>56</u>	<u>100</u>
<b>Total Effects</b>	<b>583</b>	<b>11</b>	<b>225</b>	<b>345</b>

### **Impacts of the NPS Park Payroll**

The park itself employed 10 people in FY 2007 with a total payroll including benefits of \$433,000. Including secondary effects, the local impact of the park payroll in 2007 was 13 jobs, \$503,000 in labor income and \$555,000 total value added. Including both visitor spending and park operations, the total impact of the park on the local economy in 2007 was 24 jobs and \$900,000 value added. Park operations account for 54% 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 Agate Fossil 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 15%.

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.

Cases reporting some expenses but leaving other categories blank were completed with zeros. Respondents that did not complete the spending question were assumed to spend no money on the trip. Fourteen cases had missing spending data and 12 cases reported zero spending. These cases were all visits by local residents or day trips.

Six cases with party sizes greater than seven and five cases with lengths of stay greater than seven nights were omitted in computing spending averages. (See Appendix B for details). As the sample only covers visitors during a single week, we must assume these visitors are representative of visitors during the rest of the year to extrapolate to annual totals.

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 68% of all visitor spending being attributed to park visits.

## **REFERENCES**

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## 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"> <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>

## 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 196 cases with valid spending data, 5 cases reporting zero spending and 72 cases not completing the spending question. Most of the cases with missing spending data are classified in the other overnight segment. 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	Motel	Other OVN	Total
Report some spending	6	22	126	42	196
Missing spending data	6	13	0	53	72
<u>Zero spending</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>3</u>	<u>5</u>
Total cases	12	37	126	98	273
Percent zero	0%	5%	0%	3%	2%
Percent missing	50%	35%	0%	54%	26%

Eleven cases were omitted from the spending analysis. Five of these reported stays of more than seven nights. Six cases reported party sizes greater than 7. The overall spending is not influenced significantly by these omissions.

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

Segment	With outliers			Without outliers			Pct Error <sup>a</sup>
	Mean	N	Std. Deviation	Mean	N	Std. Deviation	
Local	40	12	31	36	22	39	46%
Day trip	45	37	56	34	144	63	31%
Motel	307	126	247	300	49	382	36%
<u>Other OVN</u>	<u>111</u>	<u>98</u>	<u>122</u>	<u>101</u>	<u>26</u>	<u>75</u>	<u>29%</u>
Total (weighted)	189	273	215	183	253	229	15%

a. Pct errors computed at a 95% confidence level

## Appendix C. Impacts of all Visitor Spending, 2007

Table C1 gives the impacts of all \$796,000 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 50% 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
<b>Direct Effects</b>				
Motel, hotel cabin or B&B	275	7	120	194
Camping fees	27	0	0	0
Restaurants & bars	140	3	55	62
Admissions & fees	47	1	17	29
Local transportation	4	0	2	3
Grocery stores	12	0	5	7
Gas stations	37	0	14	19
Other retail	44	1	20	28
Wholesale Trade	20	0	11	13
<u>Local Production of goods</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>
<b>Total Direct Effects</b>	608	13	246	354
<u>Secondary Effects</u>	<u>241</u>	<u>3</u>	<u>81</u>	<u>146</u>
<b>Total Effects</b>	849	16	327	500