

Impacts of Visitor Spending on Local Economy: Pictured Rocks National Lakeshore, 2001

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Executive Summary

Pictured Rocks National Lakeshore hosted 421,000 recreation visits in 2001. Park visitors spent \$14.8 million dollars in the local area (within 60 miles to the park) generating \$4.6 million in direct personal income (wages and salaries) for local residents and supporting 426 jobs in the area.

Economic impacts were estimated with the updated National Park Service Money Generation Model (Version 2). The MGM2 model uses park visitation data, spending averages from the 2001 Pictured Rocks National Lakeshore Visitor Survey and Alger County multipliers to estimate spending, income and jobs attributable to the park. The 421,000 recreation visits equate to 155,000 party days/nights in the area (Table E1). The three largest segments in terms of party trips were day trips from outside the area¹ (33%), visitors staying overnight in motels outside the park (31%) and campers staying outside the park (18%). Park visitors accounted for about 60,200 room nights in area motels, 7,800 camping nights inside the park and 43,800 camping nights outside the park.

Table E1. Pictured Rocks NL visits and spending by segment

Lodging segment	Party trips (000's)	Party nights (000's)	Average spending (per party night)	Total spending (millions)	Pct of spending
Local day visitor	8.6	8.6	\$26	\$0.22	2%
Non-local day visitor	28.2	28.2	\$37	\$1.06	7%
Camp-In visitor	3.3	7.8	\$47	\$0.37	2%
Back-country camper	2.8	6.4	\$17	\$0.11	1%
Motel-Out visitor	26.4	60.2	\$169	\$10.17	69%
<u>Camp-Out visitor</u>	<u>15.7</u>	<u>43.8</u>	<u>\$64</u>	<u>\$2.82</u>	<u>19%</u>
Total	84.9	155.0	\$95	\$14.75	100%

On average, park visitors spent \$95 per party per day in the local area with spending varying considerably across the six lodging segments — from \$169 per night for visitors staying in area hotels to \$17 dollars for backcountry campers. Visitors staying in hotels contributed 69% of the total park visitor spending, followed by campers staying outside the park, 19%. The majority of the visitor spending was allocated to the lodging sector (\$5.2 million), followed by restaurants (\$2.7 million) and retail trade (\$1.9 million).

The sales multiplier for Alger county is 1.24, meaning that an additional \$0.24 in sales is generated through secondary effects for every dollar of direct sales (Table E2). Secondary effects generated an additional 44 jobs, about \$979,000 in personal income and \$1.8 million in value added as visitor spending circulates through the local economy.

¹ Visitors staying with friends and relatives or an owned seasonal home in the area are treated as non-local day visitors, which counts one day of spending for each park visit.

Table E2. Economic impacts of Pictured Rocks NL visitor spending, 2001

Sector/Spending category	Direct Sales \$000's	Jobs	Personal Income \$000's	Value Added \$000's
Direct Effects				
Motel, hotel cabin or B&B	5,213	203	1,954	3,209
Camping fees	763	30	286	470
Restaurants & bars	2,738	92	911	1,320
Groceries, take-out food/drinks	1,291	39	552	904
Admissions & fees	131	4	55	67
Souvenirs and other expenses	1,583	55	776	1,308
Retail Trade	233	4	96	165
<u>Wholesale Trade</u>	<u>91</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Direct Effects	12,042	426	4,631	7,442
<u>Secondary Effects</u>	<u>2,927</u>	<u>44</u>	<u>979</u>	<u>1,825</u>
Total Effects	14,968	470	5,611	9,268
Multiplier	1.24	1.10	1.21	1.25

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Impacts of Visitor Spending on the Local Economy: Pictured Rocks National Lakeshore, 2001

Introduction

The purpose of this study is to document the local economic impacts of visitors to Pictured Rocks National Lakeshore (PIRO) in 2001. 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 into six lodging-based segments,
- 2) Spending averages for each segment, and
- 3) Economic multipliers for the local region

Model inputs are derived from the National Park Public Use Statistics, the Pictured Rocks National Lakeshore Visitor Survey, 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.

Pictured Rocks National Lakeshore and the Region

Pictured Rocks National Lakeshore was created in 1966 to protect the natural resources along the Lake Superior shoreline of Michigan's Upper Peninsula. The park is a four-season recreation destination where the opportunities for hiking, boating, camping, hunting, and winter activities are abundant. The park maintains three drive-in campgrounds at Little Beaver Lake, Twelvemile Beach, and Hurricane River with a total of 66 camping sites. The overnight fee for camping service was \$10 in 2001. In addition to camping and backcountry facilities inside the park, other lodging and visitor services can be found in the two gateway cities (Munising and Grand Marais) and nearby (Figure 1).

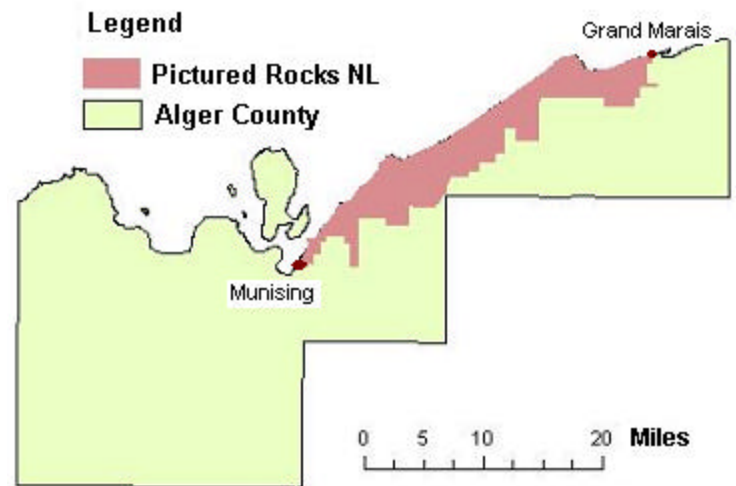


Figure 1 Pictured Rocks NL and Alger County

Total recreation visits to Pictured Rocks NL in year 2001 was 421,312 (Table 1). Total person night stays at campgrounds and backcountry sites inside the park were 16,677 and 13,773 respectively. Fifty-four percent of recreation visits, 79 percent of camping nights and 71 percent of backcountry nights were reported during the summer season, June to August, 2001.

Table 1. NPS Public Use Data for Pictured Rocks NL, 2001

Month	Recreation visits	Camping nights	Backcountry nights
January	19,725	0	78
February	19,091	0	85
March	17,256	0	89
April	12,088	0	267
May	31,371	803	1,284
June	40,125	1,878	1,813
July	94,821	5,808	3,716
August	93,493	5,534	4,219
September	45,656	2,140	1,249
October	19,934	514	652
November	9,161	0	276
<u>December</u>	<u>18,591</u>	<u>0</u>	<u>45</u>
Totals	421,312	16,677	13,773

Source: NPS Public Use Statistics (2002)

Pictured Rocks National Lakeshore is located in Alger County, Michigan. The population of Alger County in 2001 was 9,884 with an average income per capita of \$18,485. Total personal income was \$182 million, and total full-time and part-time employment was 4,014 jobs (Bureau of Economic Analysis, 2002). Wood products was the primary economic base of Alger County accounting for 52% of the outputs, 19% of jobs and about a third of wage and salary income and value added (Table 2).

Tourism is also an important component of the local economy – the restaurant sector generated \$9.4 million in sales in 1999, followed by amusements (\$4.14 million), and the lodging sector (\$3.55 million). Total tourism spending in Alger county in 2000 is estimated at \$28 million, which equates to about \$7.5 million in wages and salaries from tourism or about 7% of all wages and salaries in the county (Stynes, 2002).

Pictured Rocks National Lakeshore Visitor Survey, 2001

A park visitor study was conducted at Pictured Rocks NL from July 24 to August 4, 2001 (Simmons & Gramann 2002). The study measured visitor demographics, trip planning, travel expenditures, and facility importance and quality. Questionnaires were distributed to a sample of 616 visitors at nine locations inside the park². Visitors returned 505 questionnaires for an 82% response rate.

The sampling design of the visitor study resulted in some biases that may affect the ability to generalize to the total population of Pictured Rocks NL visitors. The sample was

² Questionnaires were distributed proportionally at the following locations: Grand Sable Visitor Center (18%), Miners Castle/Falls/Beach (18%), Munising Falls (16%), Sand Point area (16%), Sable Falls (8%), Hurricane River/Twelvemile campgrounds (8%), Chapel Area (6%), Little Beaver area (6%), and Log Slide (4%).

Table 2. Economic activity by sector in Alger County MI, 1999

Sector	Industry Output (\$ million)	Jobs	Wages and salaries ^a (\$ million)	Total value added (\$ million)	Pct of value added
Agriculture, fishing and forestry	5.18	93	0.94	1.50	1%
Mining	0.00	0	0.00	0.00	0%
Construction	26.72	277	8.28	9.13	5%
Wood-products	215.81	745	35.00	60.84	33%
Other manufacturing	10.07	76	2.43	4.07	2%
Transportation & Communication	19.72	138	4.34	10.29	6%
Wholesale Trade	3.25	56	1.34	2.30	1%
Retail Trade, excluding eat & drink	11.26	391	5.91	9.69	5%
Eating & Drinking Establishment	9.41	335	3.13	4.54	2%
Hotels	3.55	147	1.33	2.18	1%
Amusements	4.14	132	1.77	2.90	2%
Other services	82.35	977	23.42	50.09	27%
Govt, Education	25.96	604	22.74	25.96	14%
<u>Miscellaneous</u>	<u>0.00</u>	<u>8</u>	<u>0.08</u>	<u>0.00</u>	<u>0%</u>
Total	417.42	3,979	110.70	183.48	100%

a: Includes employee compensation and sole proprietor's income.

Source: IMPLAN, 1999 county data files for Alger County, MI.

gathered at selected locations inside the park during a single 10-day period from late July to early August. These locations likely over-represent visitors staying overnight in the park or visitors with a longer stay relative to, for example, local day users. Off-season visitors are generally more likely to be local residents, tend to have smaller party sizes, are less likely to camp and spend less money in the region. Snowmobilers and downhill skiers are exceptions to this pattern. Other recent visitor surveys (Warzecha, James, Anderson, and Thompson, 2000) provide a profile of off-season visitors at PIRO.

Several adjustments were made to the VSP survey results to better represent year-round visitation and spending. First, cases in the VSP study were weighted inversely to the number of days they spent inside the park to correct for over-representation of visitors with a longer stay inside the park. Second, the seasonal bias in the VSP sample was corrected by assuming lower values for some variables during the other seasons (e.g., party size and spending averages). Annual estimates were made by taking a weighted average of the summer and off-season estimates.

MGM2 Visitor Segments

MGM2 divides visitors into segments to help explain differences in spending across distinct user groups. Overnight visitors were distinguished from day visitors based on the lodging type reported in the Pictured Rocks NL visitor study questionnaire. Day visitors were divided into two groups based on the visitor's ZIP code to separate local and non-local visitors. Six lodging segments were established for Pictured Rocks NL visitors:

Local day users: Residents whose three-digit ZIP code was 498 (within 60 miles of the park). Visitors from Alger County are defined as local day visitors³.

Non-local day users: Visitors from outside the region, not staying overnight in the area. This includes day trips and pass-through travelers. Visitors staying with friends/relatives or at an owned seasonal home in the area are also treated as day visitors.

Camp-In: Visitors staying in campgrounds inside the park

Backcountry campers: Visitors staying overnight in backcountry sites

Motel-out: Visitor staying in motels, cabins, B&B's etc. outside the park within the region

Camp-out: Visitors staying in private or other public campgrounds outside the park within the region.

A recreation visit is the count of one person entering the park. Spending depends on how long visitors stay in the area rather than how many times they enter the park or how much time they spend inside the park. Recreation visits are therefore converted to party days/nights in the region before applying spending averages. This avoids double counting spending of visitors who may enter the park multiple times on the same day and also takes into account additional days a visitor may spend in the area outside the park.

Recreation visits are converted to party nights⁴ as follows:

Vehicle entries to the park = recreation visits / party size

Party trip to the area = Vehicle entries/ re-entry rate

Party nights in the area = Party trip * length of stay in the area

Distinct re-entry rates, party sizes and length of stay factors were estimated for each segment using the 2001 visitor survey data (Table 3). The average party size directly estimated from the summer visitor study was 3.2, which is consistent with the estimates from the Summer Pictured Rocks Visitor Use Study (Warzecha, James, Anderson, and Thompson, 2001). Based on off-season party sizes in the fall and winter surveys, the annual party size is 3.0⁵. Overnight

³ Alger County is defined as the local region and assumed to roughly coincide with a 60 mile radius of the park.

⁴ A party night is a travel group staying one night in the area. The travel group is usually all individuals in the same vehicle or staying in the same room or campsite. For day trips, estimates are in party days.

⁵ From three Pictured Rocks Visitor Use Studies, the average year-round party size was 3.0 after weighting for seasonal travel volumes (Warzecha, James, Anderson, and Thompson, 2000 and 2001).

visitors stayed between 2.3 and 2.8 nights⁶. Overnight visitors re-entered the park 1.0 to 2.2 times during their stay. Total party nights and spending are sensitive to the length of stay and re-entry factors. Lengths of stay indicate how many nights of spending will be counted for each visitor. Re-entry factors correct for multiple counting of the same visitors.

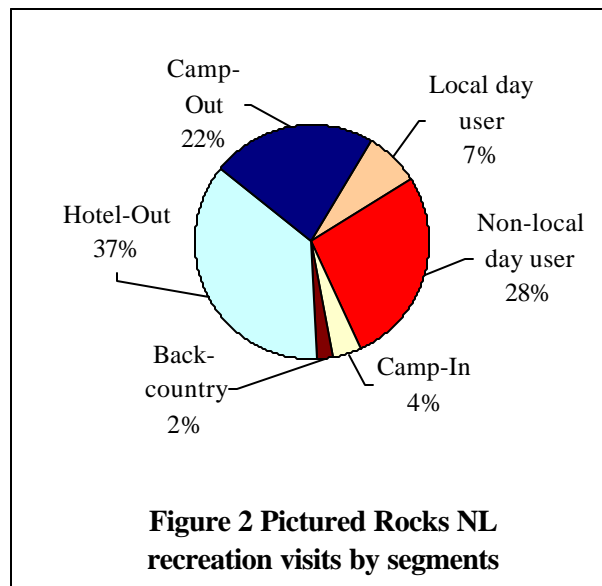
Table 3. Pictured Rocks National Lakeshore visit conversion parameters by lodging segment

Segment	Local day	Non-local day	Camp-In	Back-country	Motel-Out	Camp-Out	All Visitors
Length of stay ^a	1.00	1.00	2.36	2.25	2.28	2.80	1.82
Party size ^{ab}	3.17	3.12	2.45	3.83	2.92	2.97	3.00
Re-entries ^a	1.25	1.42	2.35	1.00	2.17	2.22	1.80
Number of cases	19	33	52	4	150	63	333

a: Computed by weighting cases inversely to number of days visitor spent inside the park

b: Party size is adjusted to reflect smaller parties in the off-season.

Using these conversion parameters, 421, 000 recreation visits equate to 153,000 vehicle entries and 155,000 party-nights (Table 4)⁷. Local residents accounted for 7% of the 421,000 recreation visits; day trips from outside the region (including stays with friends and relatives or seasonal homes in the area, 8%) accounted for 28% (Figure 2). Area motels accounted for 39% of total party nights, campgrounds 33% (5% inside the park) and backcountry stays represented 4% of party nights. We estimate that park visitors account for about 60,200 room nights⁸ in area motels and about 43,800 campsite nights outside the park in 2001.



⁶ Stays of more than 7 days or groups of more than 8 people were omitted in computing these averages.

⁷ Segment share for visitors staying at hotels was reduced by 10% from VSP survey to reflect lower hotel shares in the fall and winter studies.

⁸ A room (campsite) night is the rental of one room (campsite) for one night.

Table 4. Visit measures for Pictured Rocks NL by segment, 2001

Segment	Local day	Non-local day	Camp-In	Back-country	Motel-Out	Camp-Out	Total
Visits							
Vehicle entries to the park	10,691	40,038	7,816	2,845	57,183	34,723	153,296
Party trips	8,553	28,192	3,327	2,845	26,375	15,655	84,947
Party nights in the region	8,553	28,192	7,849	6,401	60,208	43,808	155,010
Percentage							
Pct of vehicle entries	7%	26%	5%	2%	37%	23%	100%
Pct of party trips	10%	33%	4%	3%	31%	18%	100%
Pct of party nights	6%	18%	5%	4%	39%	28%	100%

Visitor spending

Spending averages were estimated from the summer Pictured Rocks NL visitor study. Spending averages were computed on a party trip basis for each segment and then converted to a party night⁹ basis by dividing by the average length of stay. The survey covered expenditures that occurred within 60 miles of the park. Spending averages per party per night by segment are shown in Table 5.

Table 5. Visitor spending^a by lodging segment in local area (\$ per party day/night)

Spending Category	Local day	Non-local day	Camp-In	Back-country ^b	Motel-Out	Camp-Out	Total
Motel, hotel cabin or B&B	0.00	0.00	0.00	0.00	86.58	0.00	31.37
Camping fees	0.00	0.00	10.42	0.00	0.00	15.56	3.65
Restaurants & bars	9.28	12.55	6.76	5.58	30.23	9.04	17.49
Groceries, take-out food/drinks	5.31	2.93	10.50	1.30	10.43	10.39	7.68
Gas & oil	5.16	8.25	8.83	3.67	11.27	9.32	9.20
Local transportation	0.00	0.09	0.24	0.04	1.16	1.28	0.71
Admissions & fees	5.21	4.27	5.06	1.90	12.66	7.11	7.93
<u>Souvenirs and other expenses</u>	<u>1.29</u>	<u>9.41</u>	<u>5.13</u>	<u>4.18</u>	<u>16.64</u>	<u>11.70</u>	<u>11.44</u>
Total	26.25	37.50	46.94	16.67	168.96	64.40	89.50

a: Spending averages are computed by weighting cases inversely to the number of days the visitor spent inside the park. Off –season spending was assumed to be 5% below the summer values on a per day basis.

b: Backcountry spending profile is constructed as there were only 4 cases in the backcountry sample.

⁹ A party day/night represents one travel group staying in the local area for one night. For visitors on day trips, one day is treated the same as one night. The party includes all people traveling in the same vehicle or for overnight stays, all people staying in the same room or campsite.

Local day visitors spent \$26 per party per day, while day visitors from outside the local area spent \$38 per day. Campers staying outside the park spent \$64 dollars per day, about \$17 dollars more than those camping inside the park. Visitors staying at hotel, cabin and B&B spent around \$169 per day and a corresponding nightly room rate of \$87. Backcountry campers spent around \$17 dollars per party day, or about \$38 for a 2.3- night stay¹⁰.

Total visitor spending is calculated by multiplying the number of party-nights in Table 4 by the spending averages in Table 5. The calculations are carried out segment by segment, summing across the seven segments to obtain the total. Visitors to Pictured Rocks NL in 2001 spent \$14.8 million in the local area (Table 6). Visitors spent \$5.2 million on motel/hotel rooms, \$2.7 million on restaurant meals, and \$1.9 million on souvenirs. Groups staying in area motels contributed about 69 percent (\$10 million) of the total spending in the region followed by groups staying outside the park at campgrounds (19%), and non-local day visitors (7%). Park visitor spending represents about half of all tourist spending in the county.

Table 6. Total Spending by Pictured Rocks NL Visitors in 2001 (\$000's)

Spending category	Local day	Non-local day	Camp-In	Back-country	Motel-Out	Camp-Out	Total	Percent
Motel, hotel cabin or B&B	0	0	0	0	5,213	0	5,213	35%
Camping fees	0	0	82	0	0	682	763	5%
Restaurants & bars	79	354	53	36	1,820	396	2,738	19%
Groceries, take-out food/drinks	45	83	82	8	628	455	1,302	9%
Gas & oil	44	232	69	23	679	408	1,456	10%
Local transportation	0	3	2	0	70	56	131	1%
Admissions & fees	45	120	40	12	762	311	1,291	9%
<u>Souvenirs and other expenses</u>	<u>11</u>	<u>265</u>	<u>40</u>	<u>27</u>	<u>1,002</u>	<u>512</u>	<u>1,857</u>	<u>13%</u>
Total	225	1,057	368	107	10,173	2,821	14,751	100%
Percent	2%	7%	2%	1%	69%	19%	100%	

Economic Impacts of Visitor Spending

The \$14.8 million spent by Pictured Rocks NL visitors had a direct economic impact on the region of \$12.0 million in direct sales, \$4.6 million in personal income (wages and salaries), \$7.4 million in value added, and supported 426 jobs in the region¹¹ (Table 7). The lodging sector received the largest amount of direct sales (\$5.2 million), followed by restaurants (\$2.7 million) and the retail trade sector (\$1.9 million).

¹⁰ The spending profile of backcountry camper is generated by using the non-local day visitor's spending average divided by the backcountry camper's length of stay, 2.3 days.

¹¹ See Appendix A for definitions of economic terms. "Alger County" economic ratios from a 1999 input-output model were used to convert sales to the associated income, jobs and value added. The input-output model was estimated with the IMPLAN system.

Direct effects are less than total spending, as only the retail and wholesale margins on visitor purchases of goods accrue to the local economy. The local region surrounding Pictured Rocks NL captures 81% of visitor spending. Nineteen percent of visitor spending leaks out of the local economy to cover the costs of imported goods bought by visitors¹².

The sales multiplier for the region was 1.24¹³, meaning that an additional \$0.24 in sales is generated through secondary effects for every dollar of direct sales. Secondary effects generated an additional 44 jobs, about \$979 thousand dollars in personal income and \$1.8 million in value added.

Table 7. Economic Impacts of Pictured Rocks NL visitor spending, 2001

Sector/Spending category	Direct Sales \$000's	Jobs	Personal Income \$000's	Value Added \$000's
Direct Effects				
Motel, hotel cabin or B&B	5,213	203	1,954	3,209
Camping fees	763	30	286	470
Restaurants & bars	2,738	92	911	1,320
Admissions & fees	1,291	39	552	904
Gambling	0	0	0	0
Other vehicle expenses	0	0	0	0
Local transportation	131	4	55	67
Retail Trade	1,583	55	776	1,308
Wholesale Trade	233	4	96	165
<u>Local Production of goods</u>	<u>91</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Direct Effects	12,042	426	4,631	7,442
<u>Secondary Effects</u>	<u>2,927</u>	<u>44</u>	<u>979</u>	<u>1,825</u>
Total Effects	14,968	470	5,611	9,268
Multiplier	1.24	1.10	1.21	1.25

Study Limitations and Errors

The accuracy of the MGM2 estimates rests on the three inputs: visits, spending averages, and multipliers. Multipliers and economic ratios are based on an IMPLAN model for Alger

¹²For example, if a visitor buys \$50 dollars worth of clothing at a local store, the store receives the retail margin (assume \$20 dollars), the wholesaler or shipper (if local) may receive \$5 dollars, and the remaining producer price of the clothing (\$25 dollars) leaks immediately outside the local economy, unless the clothing is manufactured in the local region.

¹³ Multipliers are based on a 1999 IMPLAN model for Alger county. Multipliers reported in Table 7 are ratios of total effects to direct effects. The sales multiplier is the most commonly reported. Employment multipliers for tourism-related applications are typically smaller than the sales multiplier as the number of jobs per million in sales in the sectors impacted by secondary effects is usually smaller than in the directly impacted tourism sectors.

County and should be reasonably reliable for this application. Key visit parameters and spending averages are derived from the 2001 July-August visitor survey. Although previous Pictured Rocks NL Visitor Use Studies were used to provide supplemental information about off-season visitor patterns, the year-round estimates may still involve some level of errors. The number and kinds of visitors is likely the largest potential source of error in this study. Public use statistics provide the baseline counts of park visits, but these must be adjusted to capture the number of distinct visitors/trips to the region and their length of stay in the area.

Sampling visitors at selected entrances within a short time period during the peak season introduces some biases in parameters such as party size, length of stay, re-entry rate, and spending profiles. Off-season visitors typically possess different travel patterns than summer visitors, especially for Pictured Rocks NL where winter recreational activities are abundant. It is not clear to what extent visitors entering the park via snowmobiles or cross country skis may be captured in the visit counts. While efforts were made to adjust all estimates for off-season differences, some errors likely remain as information about lodging types and re-entry rates are not complete.

The sampling errors on the spending averages were 5% overall and ranged from 6- 28% for individual segments¹⁴. Spending averages also vary by about 10% depending on how missing spending data and outliers are treated. Our analysis omitted cases spending more than \$1,000 per day and also omitted cases with missing values in all spending categories.

Depending on the direction and magnitude of errors in visits, spending, and multipliers, these errors may compound or cancel each other. The most important potential errors are in the estimates of visits by lodging segments. As the model is linear, doubling visitors will double spending and impacts. Errors in other parameters, such as re-entry rates, length of stay and party size, would also directly translate into errors in segment shares and party nights, which are multiplied by the spending averages. Using a 95% confidence interval for spending averages and total recreation visits in 2001, the park visitors spending is estimated to range between \$13.3 million and \$16.2 million in 2001.

In addition to these statistical issues, there are also conceptual issues regarding how much and which spending should be claimed by the park. At one extreme, one could count all spending while in the region for any trips involving a visit to Pictured Rocks NL. This could spending during long stays in the area at seasonal homes or nearby resorts even if the park was visited on only one day during the stay. The most conservative approach would only count spending that could somehow be directly attributed to the park visit, possibly excluding most lodging and other spending outside the park.

The usual approach is to attempt to estimate spending that would be lost to the region in the absence of the park. This would count all spending on trips that would not otherwise be made to the area and also any extra spending associated with trips that would still occur, but might be a day less in length or involve less spending. The MGM2 economic impact estimates aim for this target as the impact of the park, although fully sorting out which spending may or may not be

¹⁴ The sampling error of spending average depends on the number of cases sampled and the variation in the sample. A small party size will typically introduce a larger sampling error.

lost in the absence of the park requires a greater knowledge of visitor behavior than exists. We assume that trips for which the park was the sole purpose would be lost to the area, but that some other trips might still be made. Counting only the equivalent of day trip spending for visitors staying at seasonal homes or with friends or relatives assumes these trips would still be made, but the day's spending for the park visit would be lost. For visitors staying overnight in the area we count roughly one full day/night spending for each day the park is visited. Hence, only two nights of spending is counted for someone staying 7 days in the area and only visiting the park on two of these.

Around 91% of park visitors indicated that Pictured Rocks NL was the primary destination or one of many planned destinations on their trips (Visitor Service Project, 2001). Local visitors are usually excluded in estimating economic impacts, but are a small component for Pictured Rocks and are included in the totals. The argument here is that in the absence of the park, locals would go outside the county for recreation, which would involve a corresponding loss in spending to the county. Since locals are a distinct segment in the MGM2 model, their contribution may be subtracted from the totals, as desired. Locals accounted for about only 2% of overall visitor spending.

Overall tourism statistics for the county provide one source for partially validating the MGM2 estimates, although it should be noted that county tourism statistics are subject to similar kinds of errors. Room taxes collected by the Munising Visitors Bureau in 2000 (\$63,475 at 2%) are consistent with the 1999 IMPLAN hotel sales figure, taking into account the bureau's coverage area. A custom tourism spending model developed by Stynes (MITEIM) estimates 69,000 hotel room nights and 34,000 campsite nights in Alger county in 2000. Based on MGM2 inputs, campsite nights associated with park visitors exceed the county total by 50%, suggesting the camper share of visitors is overestimated or we are capturing some campers staying outside Alger county. Park visitors account for about 87% of all hotel nights in the county, which may also be a little high. The estimate that park visitors account for half of overall county tourism spending seems reasonable, particularly since seasonal homes account for 39% of tourist spending in the county.

Summary and Discussion

Visitors to Pictured Rocks NL spent \$14.8 million within a 60-mile radius of the park in 2001. The total economic impact of visitor spending was \$12.0 million in direct sales, \$4.6 million in personal income, \$7.4 million in direct value added and 426 jobs. With multiplier effects, created by the re-circulation of money spent by tourists, visitor spending generated about \$15 million in local sales, and an associated \$5.6 million in personal income, \$9.3 million in value added and 470 jobs. Sectors receiving the greatest direct benefit from the park visitors were lodging (\$5.2 million in direct sales), restaurants (\$2.7 million), and retail trade (\$1.6 million).

The economic impacts of visitor spending captures the importance of the park in the region's economy. The \$14.8 million spent by park visitors in the county is about half of overall tourism spending in Alger county. The MGM2 model results can also be used to evaluate

alternative management, development and marketing decisions. The marginal economic impacts of particular visitor segments are useful for evaluating particular actions.

Table 8 shows the changes in sales, jobs, income and valued added associated with an increase or decrease of one thousand additional party-nights by each segment. Marginal impact analysis provides answers to the question: “what if?”

To evaluate the regional economic impacts of adding an additional 10 rooms, for example, to an area hotel, first compute the change in party nights – 10 rooms occupied 100 nights yearly yields 1,000 extra party nights. Applying the marginal impacts for the “Motel-out” segment in Table 8, the expansion generates an additional \$146,800 dollars in direct sales in the region, \$55,800 in personal income, \$89,800 in value added and 5.3 jobs in direct effects. The impact of this alternative could be compared to others such as expanding campsites, a marketing campaign to increase day trips, etc.

Table 8. Direct impacts of an additional 1,000 party nights by lodging segment, Pictured Rocks NL, 2001

Segments	Direct Sales (\$000's)	Jobs	Personal Income (\$000's)	Value Added (\$000's)
(Marginal Impacts per 1,000 party-nights)				
Local day visitor	18.5	0.6	7.1	11.1
Non-local day visitor	25.6	0.8	10.0	15.8
Camp-In visitor	31.5	1.1	12.5	20.2
Back-country visitor	11.4	0.4	4.5	7.0
Motel-Out visitor	146.8	5.3	55.8	89.8
Camp-Out visitor	45.8	1.6	18.3	29.4

The economic impacts presented in this report document the economic significance of 421,000 recreation visits to Pictured Rocks NL in 2001. The impacts will vary from year to year with changes in prices, visitor volumes, the mix of visitors attracted, and other changes in the park and surrounding communities. The MGM2 model has built-in procedures to price adjust spending averages over time, so updated figures may be obtained fairly easily, if there are not significant changes in visitor use and spending patterns. In the absence of significant structural changes in the local economy, multipliers will be quite stable. So the primary input for updating the estimates are visit estimates, which must take into account any changes in the mix of visitors or their length of stay in the area.

Suggested research to further refine the spending and impact estimates would include (1) a survey of off-season park visitors to refine the segment shares, party sizes, length of stay and spending profile; (2) general surveys of visitors to the region in cooperation with local tourism organizations to understand the share of visitors staying overnight outside the park.

References

- Bureau of Economic Analysis. (2002). REIS data for Alger County, 2000. <http://www.bea.gov/bea/regional/reis/>. Data retrieved on September 1, 2002.
- NLS Public Use Statistic Office. (2002). 1979-2000 Visitation DataBase. <http://www2.nature.nps.gov/stats/>. Data retrieved on September 1, 2002.
- Simmons, T. and J.H. Gramann. 2002. Pictured Rocks National Lakeshore Visitor study, Summer 2001. USDI, NPS Visitor Services Project, Cooperative Park Studies Unit, University of Idaho.
- 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.
- Visitor Services Project. (2001). Pictured Rocks National Lakeshore Visitor Study. Summer, 2001. Visitor Services Project Report #128. Moscow, ID: National Park Service and University of Idaho, Cooperative Park Studies Unit.
- Warzecha, C.A., Anderson, D.H., James, E.B., and Thompson, J.L. (2001). Visitor Use at Pictured Rocks National Lakeshore: Comparison of Backcountry and Frontcountry Users, Summer 2001. University of Minnesota, St. Paul, MN.
- Warzecha, C.A., James, E.B., Anderson, D.H., and Thompson, J.L. (2000). Pictured Rocks National Lakeshore: Visitor Use Study, Fall 2000. University of Minnesota, St. Paul, MN.
- Warzecha, C.A., James, E.B., Anderson, D.H., and Thompson, J.L. (2000). Pictured Rocks National Lakeshore: Visitor Use Study, Winter 1999/2000. University of Minnesota, St. Paul, MN.

Appendix A: Definition of Terms in the MGM2 Model

Terms	Definition
Sales	Sales of firms within the region to park visitors.
Jobs	The number of jobs in their region supported by the visitor spending. Job estimates are not full time equivalents, but include part time and seasonal positions.
Personal income	Wage and salary income, proprietor's income and employee benefits.
Value added	Personal income plus rents and profits and direct business taxes. As the name implies, it is the value added by the region to the final good or service being produced. It can also be defined as the final price of the good or service minus the costs of all of the non-labor inputs to production.
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 capture the sum of indirect and induced effects.
Indirect effects	Changes in sales, income and jobs from industries that supply goods and services to the business 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 the income earned 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 business in the area ▪ Indirect effects accrue to a broader set of economic sectors that serve these tourism firms. ▪ Induced effects are distributed widely across a variety of economic sectors.
Marginal impacts	Economic impacts created by per additional visitors or dollars spent.

Appendix B. Multipliers and economic ratios for Alger County, 1999.

Table A1. Multipliers for selected tourism-related sectors , Alger County, 1999

Sector	Direct effects			Total effects multipliers				
	Jobs/ MM sales	Income/ sales	Value Added /sales	Sales II	JobsII/ MMsales	Income II/ sales	VA II/ sales	Sales I
Hotels And Lodging Places	41.56	0.37	0.62	1.26	45.55	0.46	0.77	1.14
Eating & Drinking	35.65	0.33	0.48	1.27	39.70	0.42	0.64	1.16
Amusement And Recreation	31.98	0.43	0.70	1.24	35.87	0.51	0.85	1.11
Auto repair and services	15.46	0.31	0.51	1.18	18.64	0.37	0.62	1.09
Local transportation	30.20	0.42	0.51	1.23	33.99	0.50	0.65	1.10
Sporting goods	8.24	0.26	0.48	1.20	11.23	0.33	0.59	1.12
Retail Trade	37.04	0.49	0.83	1.22	40.72	0.56	0.96	1.08
Wholesale trade	17.23	0.41	0.71	1.22	20.87	0.49	0.84	1.10

Retail is the average or sum of the 7 retail trade sectors

SOURCE: IMPLAN input-output model of Alger County economy, 1999. All Type II multipliers are IMPLAN Type SAM.

Brief explanation of table.

Direct effects are economic ratios to convert sales to jobs, income and value added.

Jobs/MM sales is jobs per million dollars in sales.

Income/sales is percentage of sales going to wages and salaries (includes sole proprietor’s income)

Value added/sales is percentage of sales that is value added (VA covers all income, rents and profits and indirect business taxes).

Total effects are multipliers that capture the total effect relative to direct sales.

Sales II is usual sales multiplier = (direct + indirect + induced sales)/ direct sales

Sales I captures only direct and indirect 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

VA II/ Sales = total value added (direct + indirect + induced) per \$ of direct sales.

Using Hotel sector row to illustrate.

Direct Effects: Every million dollars in hotel sales creates 41 jobs in hotels. Thirty-seven percent of hotel sales goes to wages and salaries of hotel employees and 62% of hotel sales is value added. That means 38% of hotel sales goes to purchase inputs by hotels. The wage and salary income creates the induced effects and the 38% spent on purchases by the hotel starts the rounds of indirect effects.

Multiplier effects: There is an additional 14 cents of indirect sales in Alger county for every dollar of direct hotel sales (type I sales multiplier = 1.14). Total secondary sales is 26 cents per dollar of direct sales, which means 14 cents in indirect effects and 12 cents in induced effects. An additional 4 jobs are created from secondary effects of each million dollars in hotel sales (45.5 total jobs – 41.5 direct jobs per \$million). These jobs are scattered across other sectors of the local economy. Similarly, secondary income is 9% of each dollar of hotel sales (46% -37%) and secondary value added is 15% (77% -62%). Including secondary effects, every million dollar of hotel sales in Alger county yields \$1.26 million in sales, \$455,000 in income, and \$770,000 in value added.