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Impacts of Visitor Spending on the Local Economy:

Sleeping Bear Dunes National Lakeshore, 2009

ON THE COVER
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Sleeping Bear Dunes National Lakeshore, 2009

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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.

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Executive Summary

Sleeping Bear Dunes National Lakeshore hosted 1,165,836 recreation visits in 2009. Adjustments for visitor group size and re-entries resulted in 264,411 visitor group trips to the park in 2009. Based on a 2009 Visitor Services Project (VSP) survey conducted July 12-21, 43% of these visitor group trips were local residents or non-locals on day trips, not staying overnight within a one-hour drive of the park.[1] Thirty-eight percent of visitor group trips involved an overnight stay in motels, lodges or cabins outside the park, 4% of visitors groups trips were overnight stays in park campgrounds, and 9% 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 a one-hour drive of the park. In 2009, the average visitor group size was 3.3 people and spent an average of $405 in the park and within a one-hour drive of the park. Overall 95% of spending took place outside the park.

Total visitor spending in 2009 within an hour's drive of the park was $107.2 million including $5.6 million inside the park. The greatest proportions of expenditures were for lodging (48%) and restaurant meals and bar expenses (20%). Overnight visitors staying in motels or lodges outside the park accounted for 78% of the total spending.

Fifty-eight percent of visitors 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 $73.5 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 three county region including Benzie, Grand Traverse, and Leelanau counties, Michigan. This region roughly coincides with the one-hour driving radius for which spending was reported.

Including direct and secondary effects, the $73.5 million in visitor spending attributed directly to the park generates $103.5 million in sales in the region, which support 1,297 jobs. These jobs pay $33.0 million in labor income, which is part of $57.6 million in value added to the region.[2]

A separate study estimated impacts of the park employee payroll on the local economy.[3] The park itself employed 85 people in FY 2010 with a total payroll including benefits of $4.7 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were $2.9 million in sales, supporting 111 jobs, $5.6 million in labor income, and $6.4 million total value added.

Local Economic Impacts of Sleeping Bear Dunes National Lakeshore

	Sales	Jobs	Labor Income	Value Added
Park Visitor Spending	$103.5M	1,297	$33.0M	$57.6M
Park Payroll	+ $2.9M	+ 111	+ $5.6M	+ $6.4M
Park Visitor Spending + Payroll	$106.4M	1,408	$38.6M	$64.0M

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

[2] Jobs include fulltime and part-time jobs. Labor income consists of wages and salaries, payroll benefits and income of sole proprietors. Value added includes labor income as well as property income (dividend, royalties, interest and rents) to area businesses and indirect business taxes (sales, property, and excise taxes).

[3] Stynes (2011).

Acknowledgments

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Introduction

Sleeping Bear Dunes National Lakeshore (NL) includes 35 miles of Lake Michigan's eastern coastline, as well as North and South Manitou Islands. The 71,000-acre park preserves outstanding natural features, including forests, beaches, dune formations, and ancient glacial phenomena. The park is located near Empire, Michigan on the state's lower peninsula. Sleeping Bear Dunes NL received 1,165,836 recreation visits in 2009, including 112,221 overnight stays (Table 1).

Table 1. Recreation visits and overnight stays, Sleeping Bear Dunes National Lakeshore, 2009

		Overnight (OVN) Stays		
Month	**Recreation Visits**	**Campground**	**Backcountry**	**Total OVN Stays**
January	8,167	10	-	10
February	8,314	17	1	18
March	9,517	47	2	49
April	21,242	657	18	675
May	62,309	6,491	2,077	8,568
June	135,034	13,379	2,667	16,046
July	389,477	25,830	5,077	30,907
August	304,700	25,425	5,494	30,919
September	134,343	15,814	2,723	18,537
October	65,030	5,525	278	5,803
November	18,382	493	159	652
December	9,321	27	10	37
Total	**1,165,836**	**93,715**	**18,506**	**112,221**

Source: NPS Public Use Statistics 2009.

The purpose of this study is to estimate the local economic impacts of visitors to Sleeping Bear Dunes NL 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 Leelanau, Grand Traverse, and Benzie counties, Michigan.

This three-county region of Michigan has a population of 124,393 (USCB 2010), gross regional product of $5.0 billion (MIG, Inc. 2008), median household income of $50,372, and family poverty rate of 5.7% (USCB 2010). Food services and drinking places, and state and local governments are the major employers in the region (MIG, Inc. 2008), and the region experienced an 11.9% 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 Sleeping Bear Dunes NL Visitor Services Project (VSP) visitor survey (Holmes 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 Sleeping Bear Dunes NL from July 12-21, 2009 (Holmes et al. 2010).[4] This survey measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a systematic, random sample of 1,158 visitor groups. Visitors returned 696 questionnaires resulting in a response rate of 60%.

Spending and economic impact estimates for Sleeping Bear Dunes NL are based on the 2009 VSP survey. Visitors were asked to report expenditures within a one-hour drive of the park. The local region for determining economic impact was defined as a three-county area around the park including Benzie, Grand Traverse, and Leelanau counties on Michigan's lower peninsula, which roughly coincides with the one-hour driving radius for which visitor spending was reported.

The MGM2 model divides visitors into segments to help explain differences in spending across distinct user groups. Six segments were established for Sleeping Bear Dunes NL visitors based on reported trip characteristics and lodging expenditures:

Local: Visitors from the local region, not staying overnight inside the park.

Day trip: Visitors from outside the local region, not staying overnight within a one-hour's drive of the park.

Camp-in: Visitors reporting camping expenses inside the park.

Motel-out: Visitors reporting motel expenses outside the park within a one-hour's drive of the park.

Camp-out: Visitors reporting camping expenses outside the park within a one-hour's drive of the park.

Other overnight (Other OVN): Visitors staying overnight in the area but not reporting any lodging expenses. This segment includes visitors staying in private homes, with friends or relatives, or in other unpaid lodging. [5]

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

[5] 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. Segment shares from the VSP surveys were adjusted to be consistent with the park's NPS Public Use Statistics (2009) overnight stay figures.

Results

Visits

Based on the VSP survey, one-third of park entries were classified as day trip visits by either local residents or visitors from outside the region, and two-thirds were classified as overnight visits including an overnight stay in the local region (Table 2). The average visitor group size ranged from 3.1 to 3.8 people across the six segments with the average visitor group consisting of 3.3 people.[6] The average length of stay in the local region on overnight trips was 3.3 nights.

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

	Segment						
Characteristic	**Local**	**Day trip**	**Camp-in**	**Motel-out**	**Camp-out**	**Other OVN**	**All visitors**
Visitor segment share (park entries)	14.0%	19.5%	5.5%	40.0%	10.0%	11.0%	100%
Average visitor group size	3.1	3.8	3.3	3.1	3.2	3.6	3.3
Length of stay (days or nights)	1.0	1.0	3.6	3.0	3.1	4.3	3.3
Re-entry rate (park entries per trip)	1.0	1.0	1.8	1.5	1.5	2.1	1.7
Percent primary purpose trips	100%	55%	86%	50%	66%	38%	58%

Fifty-eight percent of visitors 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 1,165,836 recreation visits in 2009 were allocated to the six 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 to be once (one entry per trip) for local and day trips and half the length of stay for overnight visitors (number of nights for trip divided by two).

Recreation visits were converted to 264,411 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 878,452 person trips to the park.

[6] 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

	Segment						
Measure	**Local**	**Day trip**	**Camp-in**	**Motel-out**	**Camp-out**	**Other OVN**	**All visitors**
Recreation visits	163,217	227,338	64,121	466,334	116,584	128,242	1,165,836
Visitor group trips	52,580	59,541	10,779	100,589	24,066	16,856	264,411
Percent of visitor group trips	20%	23%	4%	38%	9%	6%	100%
Person trips	163,217	227,338	35,571	316,060	76,382	59,884	878,452

Visitor Spending

The VSP visitor survey covered expenditures of the visitor group inside the park and within a one-hour drive of the park. Spending averages were computed on a visitor group trip basis for each segment. The average visitor group in 2009 spent $405 on the trip inside the park and in the local region (Table 4). On a visitor group trip basis, average spending was $52 for day trips by local residents and $102 for day trips by non-local visitors. Visitors camping inside the park spent $323 on their trips, while those camping outside the park spent $374. Visitors staying in motels, cabins, lodges or B&B's outside the park spent an average of $829 on their trips. Visitor groups spent about 5% of their total spending inside the park and 95% outside the park.

The relative standard error at a 95% confidence level for the overall spending average is 10%. A 95% confidence interval for the overall visitor group spending average is therefore $405 plus or minus $42 or between $363 and $447.

On a per night basis, visitor groups staying in motels or lodges outside the park spent $281 in the local region, campers in the park spent $90, and campers outside the park spent $127. The average reported per night lodging expense was $158 for motels outside the park, $48 for camping fees outside the park, and $19 for camping fees inside the park (Table 5).

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. Sleeping Bear Dunes NL visitors spent a total of $107.2 million in the local region in 2009 (Table 6). Overnight visitors staying in motels outside the park account for 78% of the total spending. Lodging expenses represent 48% of the total spending, and restaurant and bar expenses represent 20% (Figure 1).

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

	Segment						
Expenditures	**Local**	**Day trip**	**Camp-in**	**Motel-out**	**Camp-out**	**Other OVN**	**All visitors***
Inside Park							
Camping fees	.00	.00	66.73	.66	4.47	.00	3.38
Restaurants & bars	.00	2.61	2.96	.98	.00	1.48	1.18
Groceries & takeout food	.46	.86	12.68	1.42	.64	.74	1.45
Gas & oil	.36	.48	9.69	.60	.00	.83	0.85
Local transportation	.00	.00	2.02	.00	1.60	.00	0.23
Admission & fees	4.64	9.41	13.48	8.13	2.96	7.09	7.41
Souvenirs & other expenses	.94	4.83	13.04	11.95	3.66	3.15	6.89
Total Inside Park	**6.41**	**18.19**	**120.59**	**23.75**	**13.32**	**13.30**	**21.38**
Outside Park							
Motel, hotel, cabin or B&B	.00	.00	.82	466.92	.00	.00	177.66
Camping fees	.00	.00	.37	2.21	141.23	.00	13.71
Restaurants & bars	15.67	31.89	55.68	151.06	72.53	37.78	79.04
Groceries & takeout food	11.72	17.06	52.09	48.92	50.43	36.26	33.81
Gas & oil	6.90	16.28	40.03	48.98	51.89	20.18	31.31
Local transportation	4.35	1.06	1.75	9.92	.89	2.78	5.21
Admission & fees	3.14	8.71	16.20	31.22	25.96	11.76	18.24
Souvenirs & other expenses	3.62	8.65	35.91	46.10	31.51	6.35	24.94
Total Outside Park	**45.41**	**83.66**	**202.84**	**805.32**	**374.45**	**115.11**	**383.92**
Total Inside & Outside Park	**51.81**	**101.84**	**323.43**	**829.07**	**387.77**	**128.40**	**405.30**

*Average weighted by percent visitor group trips.

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

	Segment			
Expenditures	**Camp-in**	**Motel-out**	**Camp-out**	**Other OVN**
Motel, hotel, cabin or B&B	0.23	158.23	0.00	0.00
Camping fees	18.61	0.97	47.73	0.00
Restaurants & bars	16.26	51.52	23.76	9.17
Groceries & takeout food	17.96	17.06	16.73	8.64
Gas & oil	13.79	16.80	17.00	4.91
Local transportation	1.04	3.36	0.82	0.65
Admission & fees	8.23	13.34	9.47	4.40
Souvenirs & other expenses	13.58	19.67	11.52	2.22
Total per visitor group per night	**89.71**	**280.95**	**127.03**	**29.98**

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

Expenditures	Segment						
	Local	Day trip	Camp-in	Motel-out	Camp-out	Other OVN	All visitors
Inside Park							
Camping fees	0	0	719	67	108	0	893
Restaurants & bars	0	155	32	99	0	25	311
Groceries & takeout food	24	51	137	143	15	12	383
Gas & oil	19	29	104	60	0	14	226
Local transportation	0	0	22	0	38	0	60
Admission & fees	244	561	145	818	71	120	1,958
Souvenirs & other expenses	50	288	141	1,202	88	53	1,821
Total Inside Park	**337**	**1,083**	**1,300**	**2,389**	**321**	**224**	**5,653**
Outside Park							
Motel, hotel, cabin or B&B	0	0	9	46,966	0	0	46,975
Camping fees	0	0	4	223	3,399	0	3,625
Restaurants & bars	824	1,899	600	15,195	1,746	637	20,900
Groceries & takeout food	616	1,016	561	4,921	1,214	611	8,939
Gas & oil	363	969	431	4,927	1,249	340	8,279
Local transportation	229	63	19	998	22	47	1,377
Admission & fees	165	519	175	3,141	625	198	4,822
Souvenirs & other expenses	191	515	387	4,637	758	107	6,595
Total Outside Park	**2,387**	**4,981**	**2,186**	**81,006**	**9,011**	**1,940**	**101,513**
Total Inside & Outside Park	**2,724**	**6,064**	**3,486**	**83,395**	**9,332**	**2,164**	**107,166**
Segment Percent of Total*	3%	6%	3%	78%	9%	2%	100%

*Percentages do not total to 100% due to rounding.

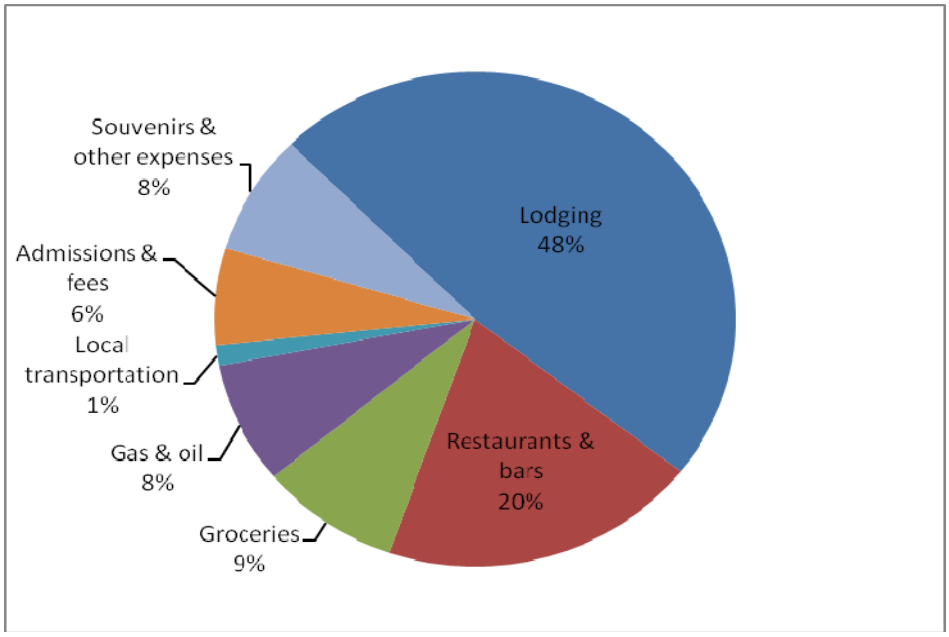

Figure 1. Sleeping Bear Dunes National Lakeshore visitor spending by category.

Because visitors would come to the region whether or not the park existed, not all visitor spending can be attributed to the park. Forty-two percent of visitors did not make the trip primarily to visit Sleeping Bear Dunes NL. 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 $73.5 million in visitor spending is attributed to the park visit (Table 7). This represents 69% of the overall visitor spending total.

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

	Segment						
Expenditures	**Local**	**Day trip**	**Camp-in**	**Motel-out**	**Camp-out**	**Other OVN**	**All visitors**
Motel, hotel, cabin or B&B	0	0	8	31,354	0	0	31,362
Camping fees	0	0	723	215	2,726	0	3,664
Restaurants & bars	0	1,627	572	10,243	1,345	358	14,145
Groceries & takeout food	24	839	641	3,428	950	332	6,215
Gas & oil	19	780	492	3,349	962	192	5,795
Local transportation	0	49	39	666	55	24	833
Admission & fees	244	963	302	2,914	552	223	5,199
Souvenirs & other expenses	50	687	489	4,298	672	109	6,304
Total Attributed to Park	**337**	**4,945**	**3,266**	**56,468**	**7,263**	**1,239**	**73,517**
Percent of Spending Attributed to the Park	12%	82%	94%	68%	78%	57%	69%
Percent of Attributed Spending	0%	7%	4%	77%	10%	2%	100%

Economic Impacts of Visitor Spending

The economic impacts of Sleeping Bear Dunes NL 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 three county region.[7] 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.[8] 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%,

[7] 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.

[8] See Appendix B: Economic Ratios and Multipliers for the region.

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 1.64. Every dollar of direct sales to visitors generates another $0.64 in secondary sales through indirect and induced effects.[9] (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 $107.2 million spent by park visitors generates $150.9 million in sales, which supports 1,905 jobs in the local region (Table 8). These jobs pay $48.2 million in labor income, which is part of $84.1 million in value added to the region.[10]

Table 8. Impacts of all visitor spending on the local economy, 2009.

Sector/Expenditure category	Sales ($000's)	Jobs	Labor Income ($000's)	Value Added ($000's)
Direct Effects				
Motel, hotel, cabin or B&B	46,975	681	15,467	28,088
Camping fees	4,519	52	1,227	2,302
Restaurants & bars	21,211	402	6,919	10,311
Groceries & takeout food	2,359	37	994	1,520
Gas & oil	1,897	22	572	1,309
Local transportation	1,437	56	445	647
Admission & fees	6,780	55	1,444	2,542
Souvenirs & other expenses	4,208	82	1,834	2,729
Wholesale trade	1,255	15	378	866
Local production of goods	1,253	0	29	38
Total Direct Effects	**91,893**	**1,403**	**29,309**	**50,351**
Secondary Effects	59,008	502	18,904	33,749
Total Effects	**150,901**	**1,905**	**48,213**	**84,100**

Note: Impacts of $107.2 million in visitor spending reported in Table 6.

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

[9] 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.

[10] 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.

economic activity in a region. The largest direct effects are in lodging establishments and restaurants.

Using only visitor spending attributable to the park by including only some spending on trips where the primary trip purpose was not to visit Sleeping Bear Dunes NL reduces the overall impacts by about 32% (Table 9; see spending inclusion assumptions in previous section). Including direct and secondary effects, the $73.5 million spent by park visitors and attributable to the park generates $103.5 million in sales, which supports 1,297 jobs in the local region. These jobs pay $33.0 million in labor income, which is part of $57.6 million in value added to the region.

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

Sector/Expenditure category	Sales ($000's)	Jobs	Labor Income ($000's)	Value Added ($000's)
Direct Effects				
Motel, hotel, cabin or B&B	31,362	455	10,326	18,753
Camping fees	3,664	43	994	1,866
Restaurants & bars	14,145	268	4,614	6,876
Groceries & takeout food	1,572	25	662	1,013
Gas & oil	1,292	15	390	892
Local transportation	833	32	258	375
Admission & fees	5,199	42	1,107	1,949
Souvenirs & other expenses	3,152	61	1,374	2,044
Wholesale trade	876	10	264	605
Local production of goods	857	0	22	28
Total Direct Effects	**62,953**	**952**	**20,012**	**34,401**
Secondary Effects	40,531	345	12,985	23,196
Total Effects	**103,485**	**1,297**	**32,997**	**57,597**

Note: Impacts of $73.5 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. Sleeping Bear Dunes NL itself employed 85 people in FY 2010 with a total payroll including benefits of $4.7 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were $2.9 million in sales, 111 jobs, $5.6 million in labor income and $6.4 million total value added (Stynes 2011).

The combined impacts to the region of visitor spending attributable to the park and NPS payroll are $106.4 million in sales which support 1,408 jobs with labor income of $38.6 million, which is part of a total value added of $64.0 million.[11]

[11] To the extent NPS recreation fees reported as visitor spending contribute to NPS payroll, there is some double counting of the impacts of recreation fees. Data about recreation fee contributions to NPS payroll are unavailable, but the overlap is believed to be minor.

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 best available knowledge about park visitor-counting methods and visitor group trip lengths report on the VSP survey.

Spending averages are derived from the 2009 Sleeping Bear Dunes NL VSP visitor survey (Holmes 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 10%.

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 (54 cases), visiting the local region for more than 7 nights (43 cases), spending greater than $3,500 (the mean plus two times the standard deviation of the mean for spending, 23 cases), or arriving in more than four vehicles (1 case) were omitted from the analysis. These are conservative assumptions about outliers and likely results in conservative estimates of economic impacts.

The VSP visitor survey sample only covered visitors during July. To extrapolate to annual totals, it was assumed that this sample represented average visitor's group sizes, trip lengths, re-entry rates, primary purpose of trips, and trip expenditures 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 42% of visitors to Sleeping Bear Dunes NL did not make the trip primarily to visit the park and 95% of spending occurred outside the park, adjustments for non-primary purpose trips have a significant effect on the overall spending and impact estimates.

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Appendix A: Glossary

Term	Definition
Direct effects	Changes in sales, income and jobs in those business or agencies that directly receive visitor spending.
Economic multiplier	Captures the size of secondary effects and are usually expressed as a ratio of total effects to direct effects.
Economic ratio	Converts various economic measures from one to another. For example, direct sales can be used to estimate direct effects on jobs, personal income, and value added by applying economic ratios. I.e., Direct jobs = direct sales * jobs to sales ratio Direct personal income = direct sales * personal income to sales ratio Direct value added = direct sales * value added to sales ratio
Indirect effects	Changes in sales, income and jobs in industries that supply goods and services to the businesses that sell directly to visitors, i.e., businesses in the supply chain. For example, linen suppliers benefit from visitor spending at 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.

Term	Definition
Secondary effects	Changes in the economic activity in the region that result from the re-circulation of money spent by visitors. Secondary effects include indirect and induced effects.
Total effects	Sum of direct, indirect and induced effects. • Direct effects accrue largely to tourism-related businesses in the area • Indirect effects accrue to a broader set of businesses that serve these tourism firms. • Induced effects are distributed widely across a variety of local businesses.
Value added	Labor income plus property income (rents, dividends, royalties, interest) and 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, Sleeping Bear Dunes NL region, 2009.

	Direct effects			Total effects multipliers				
Sector	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	14.50	0.33	0.60	1.34	1.66	20.28	0.54	0.97
Camping fees	11.60	0.27	0.51	1.42	1.72	18.01	0.51	0.92
Restaurants & bars	18.96	0.33	0.49	1.33	1.64	24.03	0.52	0.84
Groceries & takeout food	15.90	0.42	0.64	1.30	1.68	21.59	0.63	1.05
Gas & oil	11.85	0.30	0.69	1.26	1.55	16.39	0.47	1.01
Local transportation	38.78	0.31	0.45	1.26	1.56	43.73	0.49	0.77
Admission & fees	8.06	0.21	0.37	1.46	1.73	14.05	0.44	0.80
Souvenirs & other expenses	19.38	0.44	0.65	1.30	1.69	25.12	0.65	1.05
Local production of goods	4.48	0.36	0.47	1.15	1.46	8.32	0.50	0.73
Wholesale trade	6.97	0.37	0.63	1.26	1.59	12.10	0.56	0.98

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 14.5 jobs in hotels. Thirty-thirty percent of hotel sales goes to wages and salaries of hotel employees and 60% of hotel sales are value added. That means 40% of hotel sales goes to purchase inputs by hotels (e.g., linens, cleaning supplies). The wage and salary income creates the induced effects and the 40% spent on purchases by the hotel starts the rounds of indirect effects.

Multiplier effects: There is an additional 34 cents of indirect sales in the region for every dollar of direct hotel sales (type I sales multiplier = 1.34). Total secondary sales are 66 cents per dollar of direct sales, which means 34 cents in indirect effects and 32 cents in induced effects. An additional 5.8 jobs are created from secondary effects of each million dollars in hotel sales (20.3

total jobs – 14.5 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 21% (54%-33%), and the secondary effects on value added for each dollar of hotel sales are 37% (97%-60%). Including secondary effects, every million dollar of hotel sales in the region yields $1.66 million in sales, $540,000 in income, and $970,000 in value added.

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

	IMPLAN		
MGM sector	**No.**	**Name**	**2007 NAICS**
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).

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