Economic Impacts of Visitors to Olympic National Park, 2000

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REVIEW DRAFT

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Executive Summary

Economic Impacts of Olympic National Park Visitor Spending on the Local Economy, 2000

Olympic National Park hosted 3.3 million recreation visits in 2000. Park visitors spent $90 million dollars in the local area[1] generating $29 million in direct personal income (wages and salaries) for local residents and supporting 1,900 jobs in area tourism businesses. Tourism accounts for about 10% of area employment and park visitors account for 62% of tourism spending in Clallam and Jefferson counties and 28% in the four county region (including Gray's Harbor and Mason counties).

Another $27 million dollars in sales is generated through secondary effects, as visitor spending circulates through the local economy. While the direct effects accrue primarily to hotels, restaurants, amusements transportation and retail trade sectors, secondary effects benefit a wide range of local businesses. The tourism sales multiplier for the region is 1.37 indicating there is $ .37 in secondary sales for every dollar of direct sales.

Economic impacts are estimated with the newly updated NPS Money Generation Model (Version 2). The MGM2 model uses park visitation data, spending averages from the 2000 Olympic NP Visitor Survey and local economic multipliers to estimate spending, income and jobs attributable to the park.

The 3.3 million recreation visits equates to 1.1 million party days/nights in the area. The three largest segments are day trips from outside the area (visitors staying with friends and relatives or an owned seeasonal home in the area are treated as day visitors), visitors staying overnight in motels, lodges, etc. in the local area (mostly outside the park), and local visitors. Campers acount for about 160,000 party nights split about evenly between stays inside and outside the park. Park visitors account for about 250,000 room nights in area motels.

Table E1. Olympic NP Visits and Spending by Segment

Segment/Lodging Type	Recreation Visits (000's)	Party-nights (000's)	Avg Spending ($ per party per night)	Total Spending $Millions	Pct of Spending
Local Day User	798	213	27.66	5.9	7%
Non-Local Day Trips	1,361	408	45.21	18.4	21%
Lodge-Inside Park	78	23	244.13	5.5	6%
Camp-Inside Park	180	78	49.66	3.9	4%
Backcountry Campers	78	41	23.97	1.0	1%
Motel-OutsidePark	692	247	197.41	48.8	54%
Camp-Outside Park	141	79	76.31	6.0	7%
TOTAL	3,328	1,089	82.26	89.5	100%

[1] The local region includes Clallam, Jefferson, Grays Harbor and Mason counties.

On average, park visitors spend $82 per party per day in the local area. Spending varies considerably across the seven lodging segments -- visitors staying in park lodges spend $244 per night, while visitors on day trips from outside the region spend $45. Visitors staying in nearby motels account for 54% of the total park visitor spending while non-local day trips account for 21%.

The hotel sector (including camping) accounts for 40% of visitor sales, followed by restaurants (30%) and retail trade (13%). The retail trade figure only includes the margins on goods bought by park visitors as most of these goods are not made in the local area. Recreation admissions and fees and local transportation each account for about 7% of the direct sales impact.

Table E2. Economic Impacts of Olympic NP Visitor Spending, 2000

Sector/Spending category	Direct Sales $000's	Jobs	Personal Income $000's	Value Added $000's
Direct Effects				
Motel, hotel cabin or B&B	26,939	620	11,052	17,631
Camping fees	2,152	50	883	1,408
Restaurants & bars	21,181	673	7,425	10,654
Admissions & fees	5,373	156	2,198	3,610
Local transportation	3,970	93	1,877	2,366
Retail Trade	9,642	269	5,020	8,173
Wholesale Trade	1,494	18	576	1,022
Local Production of goods	1,010	2	45	81
Total Direct Effects	71,759	1,881	29,077	44,945
Secondary Effects	26,732	409	9,566	16,802
Total Effects	$98,491	2,290	$38,643	$61,748
Multiplier	1.37	1.22	1.33	1.37

Park visitors generate $11 million in personal income (wages and salaries plus payroll benefits and sole proprietor income) in the hotel sector and support 620 hotel jobs in the area.

As Olympic National Park is an integral part of area tourism, it is difficult to identify how much of this spending is due just to the park. Not all of this spending would be lost to the region if the park were closed or unavailable as many visitors would still come to the region and visit nearby attractions and facilities. The economic impacts of the park are best seen within the broader regional tourism context. We therefore encourage cooperative research and marketing activity with tourism partners in the region.

Economic Impact of Visitors to Olympic National Park, 2000

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Introduction

The purpose of this study is to document the local economic impacts of visitors to Olympic National Park (OLYM) in 2000. 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 seven lodging-based segments,
2) spending averages for each segment, and
3) economic multipliers for the local region.

Inputs are estimated from the Olympic National Park Visitor Survey, the National Park 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.

Olympic National Park and the Region

Olympic National Park was created in 1938 to protect the natural resources on the Olympic Peninsula of Washington State. The park is bordered by the Pacific Ocean on the west, the Strait of Juan de Fuca to the north, and Hood Canal to the east. The eastern edge of the park is 30 to 40 miles (48-60 km) west of the Seattle-Tacoma area, which contains over two million

Figure 1. Olympic National Park and the surrounding region.

Source: GORP, http://www.gorp.com/gorp/resource/us_national_park/wa/map_oly.htm

people. Olympic National Park is the primary travel destination on the Peninsula, receiving over 3.3 million recreation visits in 2000 and having one of the highest overnight use rates of all parks in the country (Olympic National Park, Statement of Management, 1996).

There are four concession-operated lodges inside the park. Kalaloch Lodge offers year-round operation while Lake Crescent Lodge, Log Cabin Resort and Sol Duc Hot Springs are open from April to October. Two of the lodges, Log Cabin Resort and Sol Duc Resort, offer facilities for recreation vehicles, charging $16 to $30 per vehicle per night. The Park operates 16 campgrounds with a total of 910 sites.

Total recreation visits to Olympic NP in year 2000 was 3.3 million (NPS Public Use Statistics Office, 2001). Concessioners inside the park reported 70,758 person nights in lodges and 8,855 camping nights. Park operated campgrounds generated 210,201 person nights and 115,464 backcountry stays (Table 1). Sixty percent of recreation visits, 65% of lodge stays, 81% of camping nights and 75% of backcountry stays were generated during the months of June-September in 2000.

Table 1. NPS Public Use Data for Olympic NP, 2000

		Overnight Stays						
			Developed Campgrounds					Total
Month	Recreation visits	Lodge	Concession	NPS- Tent	NPS- RV	Misc. campers	Back-country	overnight stays
January	107,655	1,672	0	470	680	0	624	3,446
February	115,064	2,306	0	680	1,239	0	950	5,175
March	126,936	2,736	0	1,047	1,601	0	1,851	7,235
April	180,927	4,599	348	2,366	2,898	0	2,519	12,730
May	298,942	3,964	705	6,258	4,694	0	4,225	19,846
June	353,597	9,490	929	15,154	8,846	60	7,858	42,337
July	496,673	14,016	2,610	33,023	20,512	199	25,107	95,467
August	690,936	13,490	3,422	42,505	22,397	149	34,838	116,801
September	427,104	10,441	841	17,238	10,371	0	18,729	57,620
October	247,361	4,812	0	6,158	5,101	0	8,775	24,846
November	138,278	1,156	0	1,630	3,097	0	6,106	11,989
December	144,249	2,076	0	587	1,649	0	3,882	8,194
Totals	3,327,722	70,758	8,855	127,116	83,085	408	115,464	405,686

Source: NPS Public Use Statistics Office, http://www2.nature.nps.gov/stats/

The Local Region

The majority of the park is located in Clallam and Jefferson counties with a small portion in Mason and Grays Harbor counties. The population of the four counties is 207,000[2] (U.S. Census Bureau, 2001). The average income per capita within these four counties in 1999 was $22,457 (Bureau of Economic Analysis, 2001).

Forestry and wood products sectors are the principal economic base of the area, accounting for 23% of output, 10% of jobs and 16% of value added[3] in the four county area. Tourism accounts for about 7-10% of jobs in the region and 3-5% of overall output. In 1998, hotel sales in the area were 94 million supporting 2,282 jobs in the hotel sector.

Table 2 . Economic Activity in Olympic NP Region, 1998

Sector	Output ($ millions)	Employ Comp ($ millions)	Jobs	Value Added ($ millions)	Pct of Outpu
Agriculture	54.89	12.16	1,221	29.49	1%
Commercial Fishing & seafood industry	247.76	32.43	1,943.64	183.33	5%
Forestry & Wood products	1,768.01	349.76	10,428	813.70	16%
Mining	58.93	5.76	402	29.76	1%
Construction	776.48	197.62	7,354	293.49	7%
Manufacturing	502.67	116.90	3,480	170.40	4%
Transp, Commun. Utilities	367.33	85.29	2,923	185.17	5%
Wholesale Trade	174.75	64.37	2,244	119.51	3%
Retail Trade	421.17	207.98	11,610	369.18	9%
Eating & Drinking Estab.	176.26	56.59	5,904	88.66	2%
Hotels	94.12	30.57	2,282	61.60	2%
Amusements	56.21	20.66	1,720	37.76	1%
Other Services	1,649.73	425.99	25,393	1,073.31	27%
Govt, Educ	852.29	582.31	16,566	705.92	18%
Misc	16.67	4.73	551	16.67	0%
Total	6,952.82	2,155.94	91,528	3,977.95	100%

Source: IMPLAN, 1998 county data files for Clallam, Jefferson, Grays Harbor and Mason Counties.

Dean Runyan estimates total travel spending to Washington State at $8 billion in fiscal year 1999[4] (Washington State Tourism Industry Resource Center, 2001). Tourism spending in Clallam, Jefferson, Mason and Grays Harbor Counties was estimated to be $421.4 million, yielding $95.3 million in total earnings[5], 8,670 jobs supported by tourism activities and $32.3 million of tax revenue in 1999. Tourism activities support about 10 percent of total employment in the region.

[2] Clallam County (64,525); Jefferson County (25,953); Mason County (49,405); Grays Harbor County (67,194).
[3] Value added includes personal income (wages, salaries, and propritor's income), profits and rents, and sales taxes.
[4] Not including air transportation.
[5] Total Earnings includes wages and salary, other earned income, and proprietor income.

Our own analysis (see Appendix _) puts tourism spending for 1998 at $320 million for the 4 county region and $145 million for the two counties of Clallam and Jefferson.

Olympic National Park Visitor Survey, 2000

A park visitor study was conducted at Olympic National Park during July 7-16, 2000.[6] The study measured visitor demographics, trip planning, travel expenditures, and facility importance and quality. Questionnaires were distributed to a sample of 1,189 visitors at visitor centers, ranger stations and lodging facilities[7]. Visitors returned 928 questionnaires for a 78% response rate.

Analysis of the visitor survey dataset was carried out at Michigan State University to identify visitor segments, to estimate spending averages for these segments, and to develop parameters for expanding from the sample to all park visitors.

The sampling design of the visitor study resulted in some biases that affect the ability to generalize to the total population of Olympic National Park visitors. The sample was gathered at selected locations inside the park during a single 10 day period in July. These locations likely over-represent visitors staying overnight in the park and longer stay visitors relative to, for example, local day users. Sampling only in July will bias results toward summer visitor characteristics and use patterns. Generally off season visitors are more likely to be local residents, are less likely to camp, usually involve smaller parties, and often spend less time and money in the area.

Several adjustments were made to the survey results to reduce these biases. An indication of the bias from sampling locations is provided by comparing the official park overnight stay figures with corresponding estimates derived from the sample. If the proportions of visitors staying overnight in the park from the (unadjusted) sample are expanded to all visitors, park overnight stays are three times those reported in the public use data. It appears that visitors staying overnight inside the park were three times as likely to be sampled. The results were adjusted for the seasonal bias by assuming somewhat lower off-seaon values for some variables and taking a weighted average of the summer and off-season estimates. Based on the public use data, about half of Olympic NP visitors come during June-August. For example, an annual party size figure of 2.8 was derived as an average of the survey (summer) average of 3.1 and an off-season figure of 2.5.

[6] Ormer, C.V., Littlejohn, M. & Gramann, J.H. (2001). Olympic National Park Visitor Study, Summer 2000. Visitor Services Project Report #121. Moscow, ID: National Park Service and University of Idaho, Cooperative Park Studies Unit.

[7] Questionnaires were distributed proportionally at the following locations: Hoh Rain Forest Visitor Center (17%), Hurricane Ridge Visitor Center (17%), Main Olympic NP Visitor Center (10%), Rialto Beach (10%), Sol Duc (10%), Staircase (10%), Quinault Ranger Station (10%), Ozette Traihead (9%), Kalaloch information station (3%), Storm King Ranger Station (2%) and Log Cabin Resort (2%).

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 Olympic visitor study questionnaire. Day visitors were divided into two groups depending on the first person's ZIP code to separate local and non-local visitors. Seven lodging segments were established for the Olympic NP visitors:

Local day users: Olympic Peninsula residents whose three-digit ZIP code was 983 or 985),

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 included in this category.

Motel-In : Visitors staying in lodges or cabins inside the park

Camp-In: Visitors staying in campgrounds inside the park (NPS or concession),

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.

The shares of visits and visitors within each lodging segment were estimated using the Olympic NP visitor survey data, supplemented by the NPS Public Use data. Olympic NP recorded 3.3 million recreation visits in 2000. Local residents account for 24% of visits; 42% are day trips from outside the region (including stays with friends and relatives or seasonal homes in the area). One in five visitors are staying in area motels.

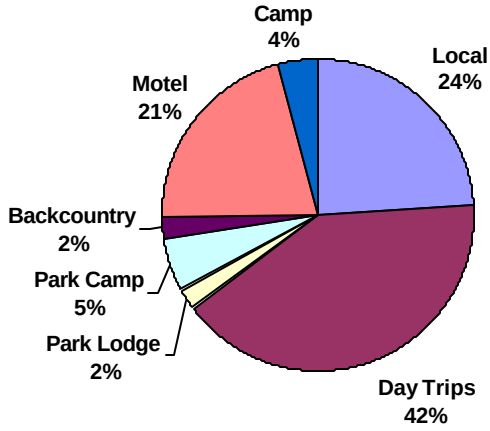

Figure 2. Olympic NP Recreation Visits by Segment

A recreation visit is one person entering the park. Spending depends on how long a visitor stays in the area rather than how many times they enter the park or how much time they spend in 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 nights[8] as follows:

Person trips to the area = recreation visits / number of park entries per trip
Person nights in the area = person trips * length of stay in area
Party nights in the area = person nights / party size

Distinct re-entry, party size and length of stay factors were estimated for each segment using the visitor survey data (Table 3). The average party size was 2.8. Overnight visitors stayed between 2.0 and 3.5 nights.[9] With many park entrances, overnight visitors re-enter the park at least twice during their stay. It should be noted that total party nights and spending will be 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, but be aware that visitors may not be able to correctly estimate re-entries in a survey

Table 3. Olympic National Park visit conversion parameters by lodging segment.

Segment	Local day user	Non-local day user	Motel-In	Camp-In	Back-country	Motel-Out	Camp-Out	Total
Party size[a]	2.8	2.8	3.1	2.8	2.8	2.8	3.1	2.8
Length of stay[b]	1.0	1.0	2.4	2.7	2.0	2.2	3.5	1.3
Re-entries	1.3	1.2	2.6	2.2	1.4	2.2	2.0	1.45
Number of cases[c]	72	116	53	163	50	223	68	766

a: Average party sizes were adjusted for the seasonal bias, assuming an off-season party size of 2.5.
b: Length of stay was computed by weighting cases inversely to the reported length of stay, as the sample was assumed to be a sample of nights rather than trips.
C: Cases reporting multiple lodging types were allocated to segments based on the types reported, e.g. someone reporting two types of lodging contributed ½ to each type. Omitted cases include those with missing data and some outliers.

Using these conversion parameters, 3.3 million recreation visits equates to 2.3 million person-trips, 3.1 million person-nights and 1.1 million party-nights (Table 4) . The estimates of person nights inside the park roughly equal park overnight stay figures. About two-thirds of recreation visits are day trips with local residents accounting for 24% and visitors from outside the region 41%. Visitors staying with friends and relatives in the area or an owned seasonal home are treated as non-local day users. Area motels account for 25% of party nights (2% inside the park), campgrounds 14% (half inside the park) and backcounty stays represent 4% of party nights. We estimate that park visitors account for about 250,000 room nights in area motels and about 80,000 campsite nights outside the park.

[8] 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.
[9] Stays of more than 10 nights and groups of more than 8 people were omitted in computing these averages.

Table 4. Visit measures for Olympic NP by segment, 2000

Segment	Local day user	Non-local day user	Motel-In	Camp-In	Back-country	Motel-Out	Camp-Out	Total
Visit Measures in 000's								
Recreation visits (person-entries)	798	1,361	78	180	78	692	141	3,328
Person-trips[a]	596	1,142	30	82	56	317	69	2,293
Person-nights[b]	596	1,142	70	219	115	692	245	3,078
Party-nights[c]	213	408	23	78	41	247	79	1,089
Percents by segment								
Pct of recreation visits	24%	41%	2%	5%	2%	21%	4%	100%
Pct of person-trips	26%	50%	1%	4%	2%	14%	3%	100%
Pct of person-nights	19%	37%	2%	7%	4%	22%	8%	100%
Pct of party-nights	20%	37%	2%	7%	4%	23%	7%	100%

a: Person-trip = recreation visits / re-entry rate
b: Person-night = person-trip * length of stay
c: Party-night = person-night / party size

Visitor spending

Spending averages were estimated from the Olympic NP visitor study. After removing some outliers, spending averages were computed on a party trip basis for each segment and then converted to a party night basis by dividing by the average length of stay. The survey covered expenditures that occurred on the Olympic Peninsula. Spending averages were reduced by 5% across all segments to adjust for the summer-season bias in the sample[10]. Spending averages per party per night by segment are shown in Table 5.

Local day visitors spent $28 per party per day, while day visitors from outside the local area spent $45 per day. Overnight visitors staying inside the park in lodges or cabins spent $244 per party per night, about $47 dollars more than those staying in motels outside the park. These spending figures correspond to a nightly room rate of $134 inside the park and $97 outside. Campers staying inside the park spent $50 per night, while campers staying outside the park spend $76 per night. Backcountry campers spent around $24 dollars per party per night trip, or about $50 for a two night stay. Visitors staying with friends and relatives or other unpaid lodging are treated as day visitors and grouped with the Non-local day visitors.

[10] We assumed visitors during the off-season spend 10% less than summer visitors. As about 50% of Olympic NP visitors come in June, July or August, the annual averages are reduced by 5%.

Table 5. Visitor Spending by Lodging Segment in Local Area ($ per party per night)

Spending Category	Local Day User	NL-Day User	SEGMENT Motel-In	Camp-In	Backcountry Campers	Motel-Out	Camp-Out
			spending per party per night ($)				
Motel, hotel cabin or B&B	0.00	0.00	134.06	0.00	0.00	96.67	0.00
Camping fees	0.00	0.00	0.00	9.74	0.00	0.00	17.63
Restaurants & bars	5.96	14.22	53.36	6.13	2.24	45.62	13.37
Groceries, take-out food/drinks	5.50	5.97	13.68	11.99	11.85	12.41	12.26
Gas & oil	6.15	8.99	9.48	10.05	7.66	13.11	16.86
Local transportation	0.22	3.71	9.73	1.29	0.00	7.49	3.00
Admissions & fees	4.90	5.67	7.88	3.07	0.56	4.97	4.45
Souvenirs and other expenses	4.92	6.66	15.95	7.37	1.68	17.15	8.73
Total	**27.66**	**45.21**	**244.13**	**49.66**	**23.97**	**197.41**	**76.31**

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 Olympic NP in 2000 spent $90 million in the local area (Table 6). Visitors spent $27 million on motel/hotel rooms, $21 million on restaurant meals, and $10 million on souvenirs. Groups staying outside the park in motels (Motel-out) were responsible for about 50 percent ($49 million) of the total spending to the region followed by non-local day users (21%), local day users (7%), outside-the-park campers (7%), and groups staying inside the park in lodges/motels/cabins (6%).

Table 6. Total Spending by Olympic NP Visitors in 2000 ($000's)

			SEGMENT					Total
	L-Day User	NL-Day User	Motel-In	Camp-In	Backcountry Campers	Motel-Out	Camp-Out	
Motel, hotel cabin or B&B	0	0	3,047	0	0	23,891	0	26,939
Camping fees	0	0	0	761	0	0	1,391	2,152
Restaurants & bars	1,269	5,799	1,213	479	92	11,274	1,055	21,181
Groceries, take-out food/drinks	1,171	2,433	311	936	487	3,068	967	9,373
Gas & oil	1,308	3,667	215	785	314	3,239	1,330	10,860
Local transportation	48	1,512	221	101	0	1,850	237	3,970
Admissions & fees	1,042	2,311	179	240	23	1,227	351	5,373
Souvenirs and other expenses	1,047	2,717	362	575	69	4,238	689	9,698
Total	5,885	18,440	5,550	3,876	985	48,788	6,021	89,545
Percent	7%	21%	6%	4%	1%	54%	7%	100%

Economic Impacts of Visitor Spending

The $90 million spent by Olympic NP visitors had a direct economic impact on the region of $72 million in direct sales, $29 million in personal income (wages and salaries), $45 million in value added, and supported 1,881 jobs in the region (Table 7). The lodging sector received the largest amount of direct sales ($27 million), followed by restaurants ($21 million) and retail trade ($9.6 million).

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 Olympic NP captures 80% of visitor spending. Twenty percent of visitor spending leaks out of the local economy to cover the costs of imported goods bought by visitors.[11]

The sales multiplier[12] for the region is 1.37, meaning that an additional $ .37 in sales is generated through secondary effects for every dollar of direct sales. Secondary effects geneate an additional 400 jobs, about $10 million in personal income and $17 million in value added.

Table 7. Economic Impacts of Olympic NP Visitor Spending, 2000

Sector/Spending category	Direct Sales $000's	Jobs	Personal Income $000's	Value Added $000's
Direct Effects				
Motel, hotel cabin or B&B	26,939	620	11,052	17,631
Camping fees	2,152	50	883	1,408
Restaurants & bars	21,181	673	7,425	10,654
Admissions & fees	5,373	156	2,198	3,610
Local transportation	3,970	93	1,877	2,366
Retail Trade	9,642	269	5,020	8,173
Wholesale Trade	1,494	18	576	1,022
Local Production of goods	1,010	2	45	81
Total Direct Effects	71,759	1,881	29,077	44,945
Secondary Effects	26,732	409	9,566	16,802
Total Effects	$ 98,491	2,290	$ 38,643	$ 61,748
Multiplier	1.37	1.22	1.33	1.37

[11] For 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.

[12] Multipliers and economic ratios for the four county region are from a 1998 input-output model estimated with the IMPLAN system.

Study Limitations and error

The accuracy of the MGM2 estimates rests on the three inputs : visits, spending averages, and multipliers. The number and kinds of visitors is likely the largest potential source of error. Spending calculations require estimates of visits in person or party nights in the area, so park re-entry estimates and length of stay parameters are critical. Visitors may not accurately report re-entries and the visitor estimates may not exactly coincide with park visitor counting procedures.

Sampling visitors inside the park vs at entrances introduces unknown biases in the distribution of visitors across lodging segments. Adjustments have been made to attempt to reduce these biases, but there are no independent figures to readily estimate the shares of visitors staying overnight outside the park. The direct estimates from the VSP study of the shares of visitors staying overnight inside the park were three times the corresponding estimates using park overnight stay data.

The sampling errors on the per night spending averages are 6% overall and range from 8-20% for individual segments (95% confidence interval). Spending averages can also vary by about 10% based on decisions to treat missing spending data as zeros or not, and how many and which outliers to delete. Our analysis generally took a conservative approach (i.e., yielding lower averages).

The multipliers and economic ratios used to convert spending to jobs and income and to estimate secondary effects come from an IMPLAN model for the four county region. While it is difficult to estimate confidence levels for multipliers, they can vary by about 10% between different modeling systems. Multipliers largely influence the estimates of secondary effects.

Depending on the direction and magnitude of errors in in visits, spending, and multipliers, the different errors may compound or cancel each other. The most important potential errors are in the estimates of visits, length of stay in the area, and re-entries. As the model is linear, doubling visitors will double spending and impacts. Errors in re-entry estimates or lengths of stay directly translate into errors in party nights, which is multiplied by the spending averages.

Since sampling was carried out inside the park at various locations, longer stay visitors had a higher chance of being sampled. We weighted inversely to length of stay in computing the averages to adjust for this bias, although this likely over-corrects a bit. Also dropping of cases with stays longer than 10 nights also reduces the averages slightly. The weighted lengths of stay from VSP study are lower than statewide tourism averages.

Some sensitivity analysis indicates the potential impact of errors in any of the MGM2 inputs. If the length of stay for the motel-out segment is increased from 2.2 to 3 nights, the overall spending increases from $90 to $110 million. The survey also may have underestimated local transportation and retail expenses. Increasing spending in these categories by 50% raises overall spending from $90 to $100 million. These two adjustments combined would increasse spending to about $125 million, now 83% of the two county tourism spending total and 40% of

four county region. We therefore suggest a range of $90-$125 million as the park visitor spending estimate.

In addition to these statistical issues, there are also conceptual issues regarding how much and which spending may be claimed by the park. Only 78% of park visitors indicated that visiting Olympic NP was the primary reason for visiting the Olympic Peninsula. Nine percent were visiting friends and relatives, 9% came for other attractions and 4% were on business trips (Ormer, Littlejohn and Gramann, 2001). For those visiting friends and relatives, we have only counted one day of spending for each day they visit the park. Those with seasonal homes in the area were treated similarly. We did not attempt to separate spending attributable to the park for other groups, although this will be partially handled by the length of stay, which indicates how many nights of spending are counted for each segment.

Local visitors are usually excluded in estimatng economic impacts, but have been included here. Since they are a distinct segment, their contribution to the totals is readily estimated and subtracted from totals, as desired. Locals account for about $6 million of the $90 million in spending.

Summary and Discussion

Visitors to Olympic NP spent $90 million within the Olympic Peninsula in 2000. The total economic impact of visitor spending was $71 million in direct sales, $29 million in personal income, $45 million in direct value added and 1,881 jobs. With multiplier effects, created by the re-circulation of the money spent by tourists, visitor spending generated about $100 million in local sales, and an associated $39 million in personal income, $62 million in value added and 2,290 jobs.

We estimate that all tourist spending in the region in 1998 was about $320 million[13]. Park visitors therefore account for about 28% of all tourist spending in the region and 62% of tourist spending in Clallam and Jefferson counties.

If increased economic impact is a goal, management strategies that motivate park visitors to stay overnight in the area or to extrend lengths of stay should be encouraged as overnight visitors inject the most money into the Peninsula's economy, particularly visitor staying in lodges and motels.

Sectors receiving the greatest benefit from the park visitors are lodging ($29 million in direct sales), restaurants ($21 million), and retail trade ($9.6 million). The park's relative importance to the local economy can be identified by comparing these figures with local tourism and economic statistics. For example, total hotel sales in Clallam and Jefferson counties was $44

[13] Dean Runyon Assoc. (2000) estimates $421 million in tourism spending for the four county area in 1999. This estimate is higher than ours, likely due to applying statewide spending averages to this region. Runyon's hotel and retail spending estimates are comparble to our estimates, but their restaurant and recreation spending estimates are about double. See Appendix _ for a more complete comparison.

million in 1998 (four county total was $94 million. Park visitors therefore account for 65% of hotel sales in two county region (29% for four counties).

The total impacts are useful for accountability purposes, garnering park support, and explaining the role of the park in the region's economy. 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?"

For example, to evaluate the regional economic impacts of adding an additional 10 rooms to a park lodge, first compute the change in party nights – 10 rooms occupied 100 nights yields 1,000 extra party nights. Applying the marginal impacts for the "Motel-in" segment in Table 8, the expansion generates an additional $212,000 dollars in direct sales in the region, $73,000 in personal income, $108,000 in value added and 5 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, Olympic NP, 2000

	Marginal Impacts per 1,000 party-nights			
Segments	Direct Sales ($000's)	Jobs	Personal Income ($000's)	Value Added ($000's)
Local day user	23.8	0.6	8.5	13.1
Non-local day user	42.0	1.1	15.8	23.1
Motel-In	212.3	5.1	72.9	108.0
Camp-In	32.4	0.7	11.4	17.4
Back-country	28.1	0.6	10.0	14.9
Motel-Out	151.6	3.7	52.6	77.8
Camp-Out	50.0	1.2	17.9	26.7
VFR	28.5	0.7	10.6	16.1

The economic impacts presented in the report document the economic significance of 3.3 million recreation visits to Olympic NP in 2000. 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 current visit estimates, which must take into account any changes in te 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, (2) short surveys at park entrances to refine the segment shares and re-entry figures, (3) general surveys of visitors to the region in cooperation with local tourism organizations, and (4) additional comparisons of park visitor characteristics, spending and impacts with other secondary sources of tourism activity in the region such as the Dean Runyon study, local room taxes and occupancy rates, and other local economic statistics.

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Appendices

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 the region supported by 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. ▪ 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 : Visit Conversion and Segment Shares
Appendix C : Spending estimates from VSP survey
Appendix E: Comparison with area Tourism Statistics

Appendix D: Regional multipliers and economic ratios by sector

Table M2. Multipliers for tourism-related sectors, Four County Olympic NP Region

	Direct effects			Total effect multipliers				
Sector	Jobs/ MM sales	Personal inc/sales	Value Added /sales	Sales II	JobsII/ MMsales	IncII/ sales	VA II/sales	Sales I
Hotels And Lodging Places	24.24	0.41	0.65	1.41	30.77	0.55	0.91	1.19
Eating & Drinking	33.50	0.35	0.50	1.38	39.32	0.48	0.73	1.20
Amusement And Recreation	30.60	0.41	0.67	1.38	36.59	0.54	0.90	1.17
Auto repair and services	13.78	0.33	0.54	1.29	18.41	0.43	0.73	1.13
Local transportation	24.56	0.47	0.60	1.37	30.46	0.61	0.83	1.14
Food processing	5.99	0.11	0.19	1.32	10.57	0.22	0.37	1.23
Apparel from purch mate	12.45	0.18	0.21	1.31	17.11	0.28	0.38	1.20
Sporting goods	10.16	0.18	0.34	1.37	15.43	0.31	0.55	1.25
Manufacturing	13.99	0.20	0.32	1.38	19.44	0.34	0.54	1.25
Retail Trade	29.41	0.52	0.85	1.33	34.79	0.64	1.06	1.09
Wholesale trade	12.84	0.39	0.68	1.34	18.28	0.51	0.89	1.14

SOURCE: IMPLAN model for region consisting of Clallam, Jefferson, Grays Harbor and Mason counties, 1998.

Definitions

Direct effect multipliers : expressed as jobs, income, or value added in the given sector per dollar of direct sales in that sector. Converts sales in a given sector to associated jobs, income and value added

Total effect multipliers: expressed as total jobs, income or value added across all sectors per dollar of direct sales in the given sector. Captures direct, indirect and induced effects. These multipliers convert from sales to other economic measures while also incuding secondary effects.

Sales II is an IMPLAN Type SAM (II) multiplier where only household income is recirculated in computing induced effects. Includes direct, indirect and induced effects.

Sales I = (direct + indirect sales)/ direct sales and only captures indirect effects.