

Impacts of Visitor Spending on the Local Economy: Glen Canyon National Recreation Area, 2007



Daniel J. Stynes
Department of Community, Agriculture, Recreation and Resource Studies
Michigan State University
East Lansing, Michigan 48824-1222

June 2009



National Park Service
Social Science Program

Department of Community, Agriculture,
Recreation and Resource Studies
Michigan State University

MICHIGAN STATE
UNIVERSITY

Impacts of Visitor Spending on the Local Economy: Glen Canyon National Recreation Area, 2007

Executive Summary

Glen Canyon National Recreation Area hosted 1.894 million recreation visits in 2007. After adjusting for re-entries to the park, there were almost 800,000 person trips to the area in 2007. Based on the 2007 spring and summer visitor surveys, 19% of these trips were day trips not including an overnight stay within 120 miles of the park. Thirty-eight percent of the trips involved an overnight stay in motels, lodges and cabins, 7% inside the park and 31% outside. Twenty-nine percent of visitors were camping, 24% inside the park and 5% outside.

The average visitor group consisted of 5.2 people and spent \$782 within 120 miles of the park. Visitors reported expenditures of their group inside the park and in the surrounding communities within 120 miles of the park. Fifty-eight percent of the spending occurred inside the park. On a party trip basis, average spending in 2007 was \$121 for day trips, \$570 for campers staying inside the park, \$390 for campers staying outside the park, \$650 for visitors in motels and lodges outside the park and \$1,081 for visitors staying in park lodges or cabins. The greatest spending was by visitors renting houseboats. Houseboat renting parties spent \$4,251 on the trip.

On a per night basis, visitors staying in motels, lodges or cabins spent \$356 if staying inside the park and \$230 if staying outside the park. Campers spent \$100 per night if staying outside the park and \$135 if staying inside. The average per night lodging cost reported by the sample of visitors was \$141 for park lodges/cabins, \$86 for lodging outside the park and \$18 for camping. Houseboat renters averaged \$704 per night, including \$391 per night for the houseboat.

Total visitor spending in 2007 within 120 miles of the park was \$137 million¹ including \$79 million spent inside the park. This does not include an estimated \$10 million in marina revenues not covered by the visitor survey. Twenty-one percent of the total spending was for lodging, 19% boat rentals, 9% restaurant meals and bar expenses, 24% gas and oil, and 10% groceries. Houseboat renters accounted for 35% of the spending, followed by visitors in motels outside the park (26%) and campers in the park (18%).

Ninety percent of the visitors made the trip primarily to visit the park. Counting only a portion of visitor expenses if the park visit was not the primary trip purpose yields \$123 million in spending attributed directly to the park visits.

The economic impact of park visitor spending was estimated by applying the spending to an input-output model of the local economy. The local region was defined as

¹ Revenues received by the park (park admissions and donations) are excluded. Impacts of spending that accrues to the park are covered as part of park operations.

the four county region including Coconino county in Arizona and Garfield, Kane and San Juan counties in Utah. This region roughly coincides with the 120 mile radius for which spending was reported.

Including direct and secondary effects, the \$147 million spent by park visitors (including additional marina spending) supports 2,511 jobs in the area and generates \$171 million in sales, \$55 million in labor income and \$88 million in value added².

The park itself employed 166 people in FY 2007 with a total payroll of \$10.2 million. Including secondary effects, the local impact of the park payroll in 2007 was 242 jobs, \$12.5 million in labor income and \$14.2 million total value added. Including both visitor spending and park operations, the total impact of the park on the local economy in 2007 was 2,753 jobs and \$102 million value added. The park payroll accounts for 9% of the employment and 14% of the value added effects.

² 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.

Impacts of Visitor Spending on the Local Economy: Glen Canyon National Recreation Area, 2007

Daniel J. Stynes
June 2009

Introduction

The purpose of this study is to estimate the local economic impacts of visitors to Glen Canyon National Recreation Area (GLCA) in 2007. Economic impacts are measured as the direct and secondary sales, income and jobs in the local area resulting from spending by park visitors. The economic estimates are produced using the Money Generation Model 2 (MGM2) (Stynes and Propst, 2000). Three major inputs to the model are:

- 1) Number of visits broken down by lodging-based segments,
- 2) Spending averages for each segment, and
- 3) Economic multipliers for the local region

Inputs are estimated from the Glen Canyon NRA Visitor Survey, National Park Service Public Use Statistics, and IMPLAN input-output modeling software. The MGM2 model provides a spreadsheet template for combining park use, spending and regional multipliers to compute changes in sales, labor income, jobs and value added in the region.

Glen Canyon National Recreation Area and the local region

The local region was defined to encompass a four county area around the park including Coconino County in Arizona and Garfield, Kane, and San Juan Counties in Utah.

Glen Canyon National Park received 1,894,114 recreation visits in 2007 and 1.28 million overnight stays (person nights) in the park (Table 1). There were 159,721 overnight stays in park lodges/cabins and 1.12 million overnight stays in park camping areas.

Park visitor surveys were conducted at Glen Canyon NRA from May 2-8, 2007 and July 14-20, 2007 (Holmes, Manni, Eury and Hollenhorst, 2008). The studies measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a sample of 968 visitors during the spring survey and 1,175 visitors during the summer. A total of 1,854 subjects returned surveys for an overall response rate of 61%. The spring and summer survey data were combined for the economic analysis.

Table 1. Recreation visits and overnight stays, Glen Canyon NRA, 2007

Month	Recreation Visits	Concession Lodging	Tent	RV	Campers			Misc.	Total Overnight Stays
					Conc.	Back Country			
January	29,707	710	19	65	94	86	2,185	3,159	
February	35,150	822	22	162	216	256	3,987	5,465	
March	90,944	4,181	220	314	2,120	3,488	20,949	31,272	
April	157,208	11,078	288	1,064	5,232	8,515	43,061	69,238	
May	216,336	17,702	380	920	8,518	5,336	93,031	125,887	
June	330,823	26,704	556	1,283	18,922	1,800	199,749	249,014	
July	346,641	25,587	983	146	13,794	935	253,381	294,826	
August	265,960	28,164	286	170	15,269	1,101	180,052	225,042	
September	190,681	22,973	282	248	9,526	1,455	121,729	156,213	
October	132,966	16,075	230	534	7,452	1,239	64,255	89,785	
November	68,378	4,181	360	124	2,120	402	17,914	25,101	
December	<u>29,320</u>	<u>1,544</u>	<u>66</u>	<u>27</u>	<u>326</u>	<u>81</u>	<u>2,798</u>	<u>4,842</u>	
2007 Total	1,894,114	159,721	3,692	5,057	83,589	24,694	1,003,091	1,279,844	

Source: NPS Public Use Statistics

MGM2 visitor segments

The MGM2 model divides visitors into segments to help explain differences in spending across distinct user groups. Eight segments were established for Glen Canyon National Recreation Area visitors based on reported trip characteristics and lodging types³:

Day trips: Visitors not staying overnight within 120 miles of the park. This segment includes day trips as well as pass-through travelers, who may be staying overnight on their trip outside the local region.

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

Camp-in: Visitors camping inside the park in campgrounds (tent or RV) or in backcountry or shoreline sites

Motel-out: Visitors staying in motels, hotels or B&B's outside the park within 120 miles of the park

Camp-out: Visitors staying in campgrounds outside the park within 120 miles of the park.

HB renters: Visitors staying in rented houseboats

HB owners: Visitors staying in owned houseboats

Other OVN: Visitors staying overnight in the area but not reporting any lodging expenses. This segment includes visitors staying in seasonal homes, with friends or relatives or other lodging.

³ Visitors reporting multiple lodging types and expenditures were classified based on the highest lodging expense.

The visitor surveys were used to estimate the percentage of visitors from each segment as well as spending averages, lengths of stay and party sizes for each segment. Segment shares from the survey were adjusted to be consistent with park overnight stay figures.

Based on the visitor survey and park overnight stay figures, 15% of park visits (entries) were classified as day trips and 85% were classified as overnight trips including an overnight stay in the local area (Table 2). The average spending party was 4 people excluding houseboat parties, which averaged over 10 people as the spending unit. The average length of stay in the area on overnight trips was 4 nights⁴.

Sixty-four percent of visitor trips were classified as being primarily to visit the park⁵. Other stated reasons were visiting friends and relatives in the area, business or visiting other area attractions.

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

Characteristic	Day Trip	Motel-in	Camp-in	Motel-out	Camp-out	HB rent	HB own	Other OVN	Total
Segment share (survey)	14.8%	13.7%	22.5%	23.5%	4.5%	14.0%	4.0%	3.0%	100%
Segment share (adjusted)	15.0%	7.0%	29.0%	24.0%	4.0%	14.0%	4.0%	3.0%	100%
Average Party size	4.9	4.3	4.0	3.4	3.6	10.9	10.0	3.8	5.20
Length of stay (days/nights)	1.00	3.04	4.22	2.82	3.90	6.04	5.54	4.33	3.62
Re-entry rate	1.76	2.53	3.22	2.43	2.32	2.18	1.71	1.94	2.48
Percent primary purpose trips	63%	59%	74%	42%	41%	78%	82%	91%	64%

The 1,894,114 recreation visits in 2007 were allocated to the eight segments using the visit segment shares in Table 2. Segment shares from the survey were adjusted slightly to be consistent with park overnight stay figures. Since spending is reported for the stay in the area, park visits (entries) were converted to trips to the area by dividing by the average number of times each visitor entered the park during their stay.

Recreation visits were converted to 798,976 person trips by dividing recreation visits by the park entry rate for each segment (Table 3). Party trips are calculated as person trips divided by the average party size. Total party trips in 2007 were 175,086. Total visitor spending is estimated by multiplying the number of party trips from each segment by the average spending estimated in the two surveys.

⁴ These figures vary slightly from the VSP reports due to omission of outliers.

⁵ Includes those stating that visiting the park was the primary purpose of the trip and also those giving other reasons related to visiting the park (e.g. boating, fishing, houseboat rental, etc.)

Table 3. Recreation visits and party trips by segment, 2007

Segment	Recreation visits	Person trips	Party trips	Party nights	Percent of party trips
Day Trip	284,117	161,000	32,857	32,857	19%
Motel-in	132,588	52,449	12,197	37,080	7%
Camp-in	549,293	170,374	42,593	179,745	24%
Motel-out	454,587	187,222	55,065	155,284	31%
Camp-out	75,765	32,657	9,071	35,379	5%
HB rent	265,176	121,764	11,171	67,473	6%
HB own	75,765	44,219	4,422	24,498	3%
<u>Other OVN</u>	<u>56,823</u>	<u>29,290</u>	<u>7,708</u>	<u>33,376</u>	<u>4%</u>
Total	1,894,114	798,976	175,086	565,691	100%

The segment mix based on party trips is somewhat different than based on park visits (entries) as visitors staying outside the park enter the park more times than those staying inside the park and visitors on day trips only enter once. Nineteen percent of visitor parties are classified as day trips and 31% are staying in motels and other commercial lodging outside the park. Forty percent of visitor parties are staying overnight inside the park compared to 36 percent staying outside. Park lodges and cabins account for 7% of visitor parties, while 24% of visitor parties are staying in park campgrounds, and 9 percent in rented or owned houseboats.

Visitor spending

The visitor survey covered expenditures of the travel party inside the park or within 120 miles of the park. Spending averages were computed on a party trip basis for each segment.

The average visitor group in 2007 spent \$782 on the trip, excluding park admission fees⁶. On a party trip basis, average spending was \$121 for day trips, \$1081 for visitors in park lodges or cabins, and \$570 for park campers (Table 4). Visitors staying in motels, cabins, lodges or B&B's outside the park spent \$650 on their trip and those camping outside the park spent \$390 (Table 4). Houseboat renters spent \$4,251 on the trip, while those in owned houseboats spent \$1,144.

The largest expenses inside the park were for transportation (includes houseboat rentals) and fuel (including boat and auto fuel). About 58% of the spending was inside the park, 42% outside. A higher percentage of camper's spending is on groceries, while visitors staying in lodges, cabins and motels spend more on restaurant meals.

⁶ Spending averages here are lower than those in the VSP report due to omission of some outliers.

Table 4. Average Visitor Trip Spending by Segment (\$ per party per trip), 2007

Spending category	Day Trip	Motel -in	Camp-in	Motel	Camp-out	HB rent	HB own	Other OVN	Overall Avg.
In Park									
Motel, cabin or B&B	0.00	346.59	2.58	12.92	0.00	264.69	33.31	4.44	46.76
Camping fees	0.00	8.01	67.47	1.25	4.16	26.86	17.90	4.50	19.94
Restaurants & bars	8.51	114.24	22.48	12.56	4.93	30.98	51.71	11.03	23.00
Groceries, take-out	6.49	27.81	38.94	6.15	8.45	263.22	94.32	27.08	35.37
Gas & oil	31.34	159.97	117.40	22.93	27.26	666.37	505.20	184.92	117.63
Marina, HB rentals	0.11	76.66	43.40	26.73	3.79	2296.47	33.08	0.67	171.91
Admissions & fees	6.03	57.89	9.81	10.49	29.38	49.22	18.06	0.00	15.97
<u>Souvenirs/other expenses</u>	6.10	37.28	30.29	8.30	8.88	87.06	64.92	16.25	22.09
In Community									
Motel, hotel cabin or B&B	0.00	84.32	18.20	230.80	13.02	90.49	28.28	0.83	90.09
Camping fees	0.00	0.37	6.68	3.43	66.49	2.61	0.35	0.00	6.35
Restaurants & bars	11.28	55.05	24.69	99.50	38.98	44.41	40.16	28.39	50.37
Groceries, take-out	8.70	24.22	50.35	35.84	44.60	148.24	77.87	62.22	43.31
Gas & oil	24.73	36.37	82.63	57.58	73.41	190.49	116.35	112.64	69.24
Local transportation	0.09	14.61	30.43	37.15	10.34	63.73	32.71	5.14	25.78
Admissions & fees	12.84	18.02	8.51	55.88	29.64	3.92	7.51	6.11	25.55
<u>Souvenirs/other expenses</u>	<u>4.73</u>	<u>20.08</u>	<u>16.61</u>	<u>28.11</u>	<u>27.03</u>	<u>22.55</u>	<u>22.89</u>	<u>10.56</u>	<u>19.05</u>
Grand Total	120.93	1081.48	570.47	649.62	390.37	4251.29	1144.62	474.78	782.41
Total in park	58.57	828.44	332.38	101.33	86.84	3684.86	818.49	248.89	452.67
Total Outside park	62.36	253.04	238.10	548.29	303.52	566.43	326.13	225.89	329.74

The sampling error at a 95% confidence level for the overall spending average is 12%. A 95% confidence interval for the overall visitor spending average is therefore \$782 plus or minus \$95 or between \$687 and \$877.

On a per night basis, visitors in park lodges spent \$356 in the local region compared to \$230 per night for visitors staying in motels outside the park. Campers spent slightly more per night if staying inside the park (\$135 per night) than outside the park (\$100). The average reported per night lodging expense was \$142 for park lodges, \$86 for motels outside the park, and \$18 for camping fees inside or outside the park (Table 5).

Total spending was estimated by multiplying the number of party trips for each segment by the average spending per trip and summing across segments. Glen Canyon NRA visitors spent a total of \$137 million in the local area in 2007 (Table 6). Houseboat renters account for 35% of the spending, followed by visitors in motels outside the park (26%) and campers staying in the park (18%).

Spending inside the park estimated from the survey is consistent with reported concession receipts in 2007, with the exception of about \$10 million in spending

associated with marina revenues. The visitor survey did not include marina-related expenses not directly related to the trip, such as wet slip and dry storage. Ten million dollars in marina revenue is added to the visitor spending figures to estimate local economic impacts of the park.

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

Spending Category	Motel-in	Camp-in	Motel - out	Camp-out	HB rent	HB own	Other OVN	Overall Avg
Motel, cabin or B&B	141.75	4.92	86.42	3.34	58.80	11.12	1.22	33.56
Camping fees	2.76	17.57	1.66	18.11	4.88	3.29	1.04	6.45
Restaurants & bars	55.69	11.18	39.74	11.26	12.48	16.58	9.10	17.99
Groceries, take-out	17.12	21.16	14.89	13.60	68.12	31.08	20.62	19.29
Gas & oil	64.58	47.40	28.55	25.81	141.86	112.19	68.72	45.82
Marina, HB rentals	30.02	17.50	22.65	3.63	390.76	11.88	1.34	48.47
Admissions & fees	24.97	4.34	23.54	15.13	8.80	4.61	1.41	10.18
<u>Souvenirs/other expenses</u>	<u>18.87</u>	<u>11.11</u>	<u>12.91</u>	<u>9.21</u>	<u>18.15</u>	<u>15.85</u>	<u>6.19</u>	<u>10.09</u>
Grand Total	355.75	135.18	230.36	100.09	703.86	206.61	109.65	191.85

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

	Day Trip	Motel-in	Camp-in	Motel - out	Camp-out	HB rent	HB own	Other OVN	Total
In Park									
Motel, cabin or B&B	0	4,227	110	711	0	2,957	147	34	8,187
Camping fees	0	98	2,874	69	38	300	79	35	3,492
Restaurants & bars	279	1,393	958	692	45	346	229	85	4,027
Groceries, take-out	213	339	1,659	339	77	2,940	417	209	6,193
Gas & oil	1,030	1,951	5,001	1,263	247	7,444	2,234	1,425	20,595
Marina, HB rentals	4	935	1,848	1,472	34	25,654	146	5	30,099
Admissions & fees	198	706	418	578	267	550	80	0	2,796
<u>Souvenirs/ other expenses</u>	<u>201</u>	<u>455</u>	<u>1,290</u>	<u>457</u>	<u>81</u>	<u>973</u>	<u>287</u>	<u>125</u>	<u>3,868</u>
In Community									
Motel, cabin or B&B	0	1,028	775	12,709	118	1,011	125	6	15,773
Camping fees	0	5	285	189	603	29	2	0	1,112
Restaurants & bars	371	672	1,052	5,479	354	496	178	219	8,819
Groceries, take-out	286	295	2,144	1,973	405	1,656	344	480	7,584
Gas & oil	812	444	3,519	3,171	666	2,128	515	868	12,123
Local transportation	3	178	1,296	2,046	94	712	145	40	4,513
Admissions & fees	422	220	362	3,077	269	44	33	47	4,474
<u>Souvenirs/other expenses</u>	<u>156</u>	<u>245</u>	<u>708</u>	<u>1,548</u>	<u>245</u>	<u>252</u>	<u>101</u>	<u>81</u>	<u>3,336</u>
Grand Total	3,973	13,191	24,298	35,771	3,541	47,491	5,061	3,660	136,988
Spending inside park	1,925	10,105	14,157	5,580	788	41,164	3,619	1,918	79,256
Spending outside the park	2,049	3,086	10,141	30,192	2,753	6,328	1,442	1,741	57,733
Segment Percent of Total	3%	10%	18%	26%	3%	35%	4%	3%	100%

Houseboat rentals account for 19% of the spending. Lodging expenses represent 21% of the total spending, restaurants and groceries 10% each, and gas and oil 24%. (Figure 1).

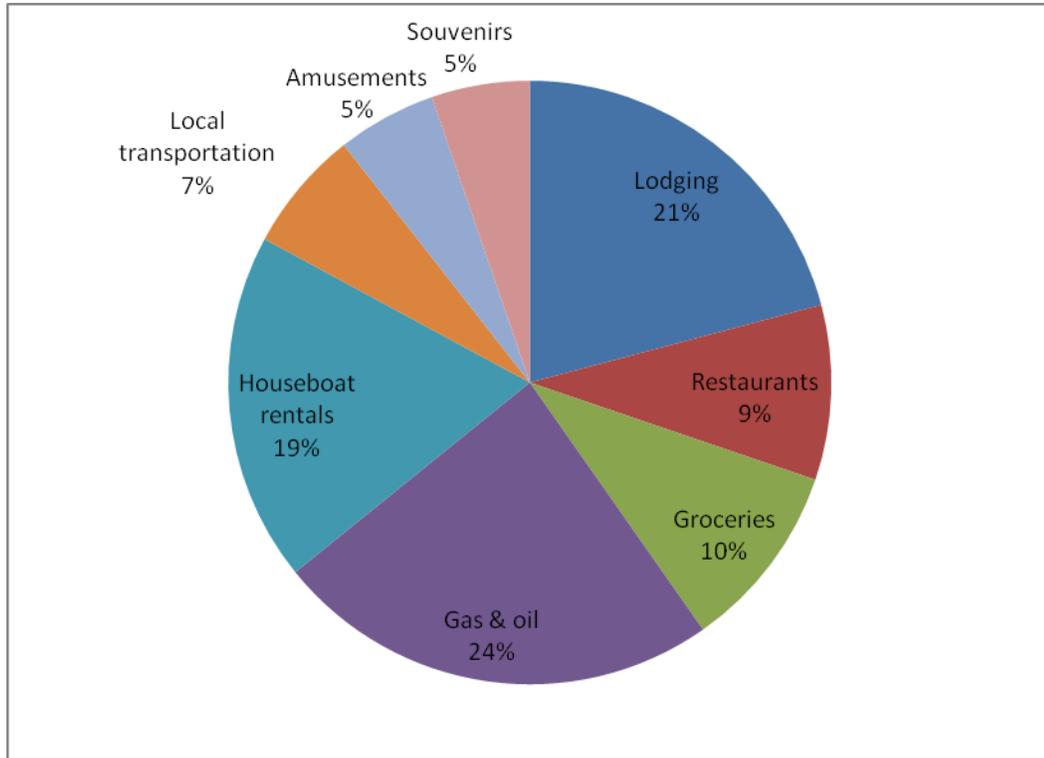


Figure 1. Glen Canyon NRA visitor spending by spending category, 2007

Not all visitor spending would be lost to the region in the absence of the park, as some visitors did not make the trip primarily to visit the park. Spending directly attributed to park visits was estimated by counting all spending for trips where 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 \$123 million in visitor spending is attributed to the park visit (Table 7). This represents 90% of the overall visitor spending total.

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

	Day Trip	Motel- in	Camp- in	Motel - out	Camp- out	HB rent	HB own	Other OVN	Total
In Park									
Motel, cabin or B&B	0	4,227	110	711	0	2,957	147	34	8,187
Camping fees	0	98	2,874	69	38	300	79	35	3,492
Restaurants & bars	279	1,393	958	692	45	346	229	85	4,027
Groceries, take-out	213	339	1,659	339	77	2,940	417	209	6,193
Gas & oil	1,030	1,951	5,001	1,263	247	7,444	2,234	1,425	20,595
Local transportation	4	935	1,848	1,472	34	25,654	146	5	30,099
Admissions & fees	198	706	418	578	267	550	80	0	2,796
<u>Souvenirs/other expenses</u>	201	455	1,290	457	81	973	287	125	3,868
In Community									
Motel, cabin or B&B	0	743	618	7,929	66	826	107	6	10,295
Camping fees	0	3	227	118	339	24	1	0	712
Restaurants & bars	303	675	899	3,561	205	418	159	205	6,426
Groceries, take-	233	213	1,711	1,231	227	1,354	294	446	5,710
Gas & oil	664	586	3,122	2,239	412	2,009	511	837	10,380
Local transportation	2	256	1,150	1,581	58	1,511	128	37	4,723
Admissions & fees	345	159	289	1,920	151	36	28	44	2,971
<u>Souvenirs/other expenses</u>	127	<u>177</u>	<u>565</u>	<u>966</u>	<u>138</u>	<u>206</u>	<u>86</u>	<u>76</u>	<u>2,340</u>
Total Attributed to Park	3,599	12,917	22,738	25,124	2,384	47,548	4,935	3,569	122,813
Percent of spending attributed to the park	91%	98%	94%	70%	67%	100%	98%	98%	90%

Economic impacts of visitor spending

The economic impacts of Glen Canyon National Park visitor spending on the local economy are estimated by applying the spending to a set of economic ratios and multipliers representing the economy of the four county region. Economic ratios convert spending to the associated jobs, income and value added in each sector⁷. Multipliers for the region were estimated with the IMPLAN system using 2001 data⁸. The tourism sales multiplier for the region is 1.47. Every dollar of direct sales to visitors generates another \$.47 in secondary sales through indirect and induced effects⁹.

Impacts are estimated based first on all visitor spending (Table 6) and then based on the visitor spending attributed to the park (Table 7). Including direct and secondary

⁷ 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

⁸ Economic ratios and multipliers for the region are reported in Appendix B. Job ratios are adjusted to 2007 based on changes in the job to sales ratios in national models.

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.

effects, the \$137 million spent by park visitors¹⁰ supports 2,511 jobs in the area and generates \$171 million in sales, \$55 million in labor income and \$88 million in value added (Table 8).

Table 8. Economic significance of visitor spending, 2007.

Sector/Spending category	Sales \$000's	Jobs	Labor income \$000's	Value added \$000's
Motel, hotel cabin or B&B	23,960	355	10,467	16,968
Camping fees	4,604	50	532	1,265
Restaurants & bars	12,845	268	5,217	5,886
Admissions & fees	7,270	167	2,679	4,497
Marina, HB rentals	44,612	765	10,410	18,903
Grocery stores	3,485	58	1,495	1,995
Gas stations	7,296	76	3,091	4,013
Other retail	3,602	70	1,697	2,372
Wholesale trade	1,475	50	760	857
<u>Local production of goods</u>	<u>7,356</u>	<u>1</u>	<u>882</u>	<u>1,204</u>
Total direct effects	116,506	1,861	37,231	57,959
<u>Secondary effects</u>	<u>54,566</u>	<u>650</u>	<u>17,506</u>	<u>30,456</u>
Total effects	171,072	2,511	54,737	88,415

Note: Impacts of \$147 million in visitor (includes visitor trip spending plus an extra \$10 million in marina revenues for boat storage and other services).

Labor income covers wages and salaries, including payroll benefits and incomes of sole proprietors. Value added is the preferred measure of the contribution to the local economy as it includes all sources of income to the area -- payroll benefits to workers, profits and rents to businesses, and sales and other indirect business taxes that accrue to government units. The largest direct effects are in lodging establishments and restaurants.

Excluding some spending on trips where the primary trip purpose was not to visit Glen Canyon NRA reduces the overall impacts by about 10% (Table 9).

Impacts of park operations

The park itself employed 166 people in FY 2007 with a total payroll of \$10.2 million. Including secondary effects, the local impact of the park payroll in 2007 was 242 jobs, \$12.5 million in labor income and \$14.2 million total value added. Including both visitor spending and park operations, the total impact of the park on the local economy in 2007 was 2,753 jobs and \$102 million value added. The park payroll accounts for 9% of the employment and 14% of the value added effects.

¹⁰ Revenues received by the park (park admissions and donations) are excluded in estimating visitor spending impacts as the impacts resulting from park revenues are covered as part of park operations.

Table 9. Economic impacts of visitor spending attributed to park visits, 2007.

Sector/Spending category	Sales \$000's	Jobs	Labor income \$000's	Value added \$000's
Direct Effects				
Motel, cabin or B&B	23,960	355	10,467	16,968
Camping fees	4,604	50	532	1,265
Restaurants & bars	12,845	268	5,217	5,886
Admissions & fees	7,270	167	2,679	4,497
Marina, HB rentals	44,612	765	10,410	18,903
Grocery stores	3,485	58	1,495	1,995
Gas stations	7,296	76	3,091	4,013
Other retail	3,602	70	1,697	2,372
Wholesale trade	1,475	50	760	857
<u>Local production of goods</u>	<u>7,356</u>	<u>1</u>	<u>882</u>	<u>1,204</u>
Total direct effects	116,506	1,861	37,231	57,959
<u>Secondary effects</u>	<u>54,566</u>	<u>650</u>	<u>17,506</u>	<u>30,456</u>
Total effects	171,072	2,511	54,737	88,415

Note : Impacts of \$133 million in visitor spending (includes visitor trip spending attributed to the park visit plus an extra \$10 million in marina revenues for boat storage and other services).

Study limitations and error

The accuracy of the MGM2 estimates rests on the accuracy of the three inputs: visits, spending averages, and multipliers. Recreation visit estimates rely on counting procedures at the park, which may miss some visitors and count others more than once during their visit. Re-entry rates 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 visitor estimates of the number of times they entered the park during their stay in the area.

Spending averages are derived from the 2007 Glen Canyon NRA Visitor Surveys. 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 12%. 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. Cases with missing overnight stay information or those reporting long stays (>30 nights) or spending greater than \$60,000 were omitted from the analysis.

The sample covers visitors during a single week in July for summer visitors and one week in May for spring visitors. To extrapolate to annual totals, it was assumed that the combined sample represented visitors year-round.

Glen Canyon reported \$90 million in concession receipts for 2007. This total is consistent with the estimates for visitor spending inside the park, with the exception of roughly \$10 million in marina revenues that were not covered by the visitor survey. The survey did not cover wet slip, dry storage, and some other marina-related expenses not associated with a particular trip. With this adjustment, total spending estimates inside the park are consistent with concession receipts reported for 2007.

Multipliers are derived from an input-output model of the local economy using IMPLAN (MIG., Inc. 1999). 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 509 sectors based on the NAICS system. The most recent local IMPLAN datasets available for this analysis were 2001. It was therefore assumed that most multipliers have remained stable thru 2007. Employment multipliers were adjusted to take into account price changes. Local job to sales ratios were adjusted from 2001 to 2007 based on the percentage changes in national job to sales ratios between 2001 and 2006 and then adjusted to 2007 based on consumer price indices. Visits are taken from NPS public use statistics.

Sorting out how much of the spending to attribute to the park when the park is not the primary motivation for the trip is somewhat subjective. However, since most visitors to Glen Canyon NRA made the trip primarily to visit the park and quite a bit of spending occurs inside the park, adjustments for non-primary purpose trips only has a small effect on the overall spending and impact estimates.

REFERENCES

MIG.Inc. IMPLAN Professional Version 2.0. Minnesota IMPLAN Group: Stillwater, MN.

Holmes, N.C., Manni, M.F., Eury, D. and Hollenhorst, S.J. 2008. Glen Canyon National Recreation Area Visitor Study. Spring and Summer 2007. Visitor Services Project Report #186. Moscow, ID: National Park Service and University of Idaho, Cooperative Park Studies Unit.

National Park Service Public Use Statistics Office. 2007. Visitation DataBase. <http://www2.nature.nps.gov/stats/>. Data retrieved on October 15, 2008.

Stynes, D. J., Propst, D.B., Chang, W. and Sun, Y. 2000. Estimating National Park Visitor Spending and Economic Impacts: The MGM2 model. May, 2000. Final report to National Park Service. East Lansing, Michigan: Department of Park, Recreation and Tourism Resources, Michigan State University.

Appendix A: Definitions of Economic Terms

Term	Definition
Sales	Sales of firms within the region to park visitors.
Jobs	The number of jobs in the region supported by the visitor spending. Job estimates are not full time equivalents, but include part time positions.
Labor income	Wage and salary income, sole proprietor's income and employee payroll benefits.
Value added	Labor income plus rents and profits and indirect business taxes. As the name implies, it is the net value added to the region's economy. For example, the value added by a hotel includes wages and salaries paid to employees, their payroll benefits, profits of the hotel, and sales and other indirect business taxes. The hotel's non-labor operating costs such as purchases of supplies and services from other firms are not included as value added by the hotel.
Direct effects	Direct effects are the changes in sales, income and jobs in those business or agencies that directly receive the visitor spending.
Secondary effects	These are the changes in the economic activity in the region that result from the re-circulation of the money spent by visitors. Secondary effects include indirect and induced effects.
Indirect effects	Changes in sales, income and jobs in industries that supply goods and services to the businesses that sell directly to the visitors. For example, linen suppliers benefit from visitor spending at lodging establishments.
Induced effects	Changes in economic activity in the region resulting from household spending of income earned through a direct or indirect effect of the visitor spending. For example, motel and linen supply employees live in the region and spend their incomes on housing, groceries, education, clothing and other goods and services.
Total effects	Sum of direct, indirect and induced effects. <ul style="list-style-type: none"> ▪ Direct effects accrue largely to tourism-related businesses in the area ▪ Indirect effects accrue to a broader set of businesses that serve these tourism firms. ▪ Induced effects are distributed widely across a variety of local businesses.

Appendix B: Multipliers

Table B1. Multipliers for selected tourism-related sectors, Glen Canyon NRA region, 2007

Sector	Direct effects			Total effects multipliers				
	Jobs/ MM sales	Labor inc/sales	Value Added /sales	Sales I	Sales II	JobsII/ MMsales	IncII/ sales	VA II/sales
Hotels and motels	14.80	0.44	0.71	1.15	1.46	20.62	0.59	0.97
Other accommodations	10.92	0.12	0.27	1.42	1.58	18.26	0.30	0.60
Food svc & drinking places	20.86	0.41	0.46	1.20	1.50	27.07	0.56	0.73
Amusements	22.98	0.37	0.62	1.20	1.48	29.30	0.52	0.89
Automotive repair	16.05	0.17	0.39	1.23	1.39	21.05	0.30	0.60
Transit & gd. Pass. Transp.	22.03	0.52	0.58	1.20	1.57	29.62	0.71	0.90
Sporting goods manf	4.72	0.20	0.27	1.24	1.40	9.59	0.33	0.48
Misc manf.	7.40	0.23	0.34	1.19	1.37	11.72	0.35	0.54
Food and beverage stores	16.71	0.43	0.57	1.23	1.54	23.76	0.61	0.88
Gasoline stations	10.41	0.42	0.55	1.24	1.55	17.65	0.61	0.87
General merch. stores	19.57	0.47	0.66	1.18	1.51	26.16	0.64	0.95
Wholesale trade	11.01	0.37	0.64	1.16	1.43	16.72	0.51	0.89

SOURCE: Input-output model of four county region economy (Coconino county, AZ; Garfield, Kane, San Juan counties, UT) estimated with the IMPLAN system.

Brief 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

Labor Income/sales is the percentage of sales going to wages and salaries

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 II is the usual Type II 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 labor income (direct + indirect + induced) per \$ of direct sales

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

Using the Hotel sector to illustrate.

Direct Effects: Every million dollars in hotel sales creates 14.8 jobs in hotels. Forty-four percent of hotel sales goes to wages and salaries of hotel employees and 71% of hotel sales is value added. That means 29% of hotel sales goes to purchase inputs by hotels. The wage and salary income creates the induced effects and the 29% spent on purchases by the hotel starts the rounds of indirect effects.

Multiplier effects: There is an additional 15 cents of indirect sales in the region for every dollar of direct hotel sales (type I sales multiplier = 1.15). Total secondary sales is 46 cents per dollar of direct sales, which means 15 cents in indirect effects and 31 cents in induced effects. An additional 5.8 jobs are created from secondary effects of each million dollars in hotel sales (20.6 total jobs – 14.8 direct jobs per \$million). These jobs are scattered across other sectors of the local economy. Similarly, secondary income is 15% of each dollar of hotel sales (59%-44%) and secondary value added is 26% (97%-71%). Including secondary effects, every million dollar of hotel sales in the region yields \$1.46 million in sales, \$590,000 in income, and \$970,000 in value added.