

***Katmai National Park and Preserve  
Economic Significance Analysis  
and Model Documentation***



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Cover photo is compliments of the Katmai National Park and Preserve website.

## Executive Summary

The purpose of this study is twofold. The first is to conduct an economic significance analysis of visitation to Katmai National Park and Preserve (Katmai NPP) using a standard economic input/output model. The second and equally important objective is to compare the National Park Service's Money Generating Model (MGM)<sup>1</sup> methodology with this more general and adaptable approach to assessing economic significance of national parks in Alaska.<sup>2</sup>

Katmai National Park and Preserve is located on the Alaska Peninsula, west of Kodiak Island. Park Headquarters is in King Salmon, about 290 air miles southwest of Anchorage (Figure 1). Katmai is becoming best known for its brown bears that congregate at Brooks Falls for the salmon run, as well as in the coastal meadows to feed on rich plant life. Approximately one-third of visitor days occur at Brooks Camp (Table 1). Another 15% of visitor days occur along the coast, especially Hallo Bay and Geographic Harbor, for late spring and early summer bear viewing; coastal visitation, however, is growing. Estimates of visitor days from Commercial Use Authorization (CUA) permit holder reports averaged 25,000 annually from 2005 through 2007. Estimates based on adjustments for visitors who arrive via their own planes and boats, visit under concession contracts, or are not otherwise required to be reported raises the average to 41,000 visitor days annually. Visitation, both temporally and to specific locations within the park, tends to follow the timing of fish returns which attracts both anglers and bears for viewing. For the park as a whole, peak visitation occurs in July followed by August (Table 2).

Several commercial airlines provide daily flights into King Salmon as there is no road access. King Salmon is the gateway for trips into the western portion of the park including Brooks Camp and the Valley of Ten Thousand Smokes, accessed by bus from Brooks Camp. The Katmai Coast is accessed by float and wheeled planes and boat from Homer, Kenai and other Kenai Peninsula communities, and Kodiak Island. Primary access to Katmai NPP is small planes landing on lakes, rivers, beaches, and sand bars, which accounts for the widely dispersed visitation patterns despite the lack of road access. Given the range of mountains running between the interior of the park and the coast and the often inclement weather, visiting Brooks Camp and the park interior from the west and the coastal area from the east would normally be on two separate trips into the park.

Visitors to Katmai NPP include both day visitors and overnight visitors; visitors come both guided and unguided. An example of an unguided day visitor is someone who visits for the day at Brooks Camp to view bears. This person could fly their own plane or arrive in their own boat or be dropped and picked up by a Commercial Use Authorization permit holder, a commercial business that has permission to operate within the park boundaries. Guided day visitors, for example, are people who hire a guide to take them to Hallo Bay for the day to view bears. Overnight visitors stay for at least one night in the park and include people who stay at the campground in Brooks Camp, at one of the lodges in the park, or camp in the back country. Overnight visitors may be guided or unguided.

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<sup>1</sup> According to its website, the MGM2 is a set of Microsoft Excel workbooks for estimating the economic impacts of NPS visitor spending on a local region. MGM2 is an update of the NPS Money Generation Model as originally developed by Ken Hornback. Daniel Stynes and Dennis Propst at Michigan State University developed the new version, called MGM2, in 2001. See: <http://web4.msue.msu.edu/mgm2/default.htm>

<sup>2</sup> Please see Appendix A, Glossary of Economic Impact Terms for clarification of modeling terms, as needed.

As a result of the logistical complexities of visiting Katmai NPP, many visitors purchase “packages” for both day and overnight visitation. Typical day packages include transportation to and from the park as well as guide services in the park. Overnight packages typically include transportation to and from the park, meals, lodging and guide services. Many visitors use guide services both for the guides’ local knowledge of fishing and bear viewing locations and because of safety considerations due to the dense population of brown bears. Most visitors are highly motivated to view bears but are unfamiliar with their presence and behavior.

Table ES1 below shows the estimates of economic impacts resulting from the money spent in Alaska during 2007 by visitors to Katmai NPP. This study's model estimates that Katmai NPP visitors spent nearly \$50 million (2007 dollars or \$51.2 million in 2009 dollars) in Alaska, with almost one-quarter of that spent inside Katmai NPP. Expenditures occurring inside the park are relatively high for a remote Alaska park because of the location of Brooks Camp, which receives a significant portion of Katmai NPP visitors, and the concession operations at Brooks Camp as well as other locations within the park. The visitor expenditures generated \$73 million (2007 dollars or \$75.5 million 2009 dollars) in total output, supported 647 jobs (*average annual jobs, not FTEs*), generated \$23 million (2007 dollars or \$23.9 million in 2009 dollars) in labor income, and added a value of \$37 million (2007 dollars or \$38.3 million in 2009 dollars) to the Alaska economy. These values are significantly higher than those generated by the course-level MGM national estimates for the *2007 National Park Visitor Spending and Payroll Impact Report*, despite that study's assumption of much higher visitation levels. We believe this illustrates the importance of portraying the uniquely Alaska economy through an approach to impact analysis that uses park-specific visitor data along with a general software package such as IMPLAN or a modified, more customizable MGM user interface.

**Table ES1. Expenditures in Alaska by visitors to Katmai NPP**

	2007\$\$	2009\$\$	MGM*
Direct Expenditures i/s Katmai NPP	\$11,942,662	\$12,335,897	
Direct Expenditures o/s Katmai NPP in Alaska	\$37,600,245	\$38,838,306	\$17,155,000
	\$49,542,907	\$51,174,203	
<b>IMPLAN Modeling Results:</b>			
Total Industrial Output	\$73,066,210	\$75,472,056	
Employment	647		286
Labor Income	\$23,102,894	\$23,863,601	\$8,701,000
Value Added	\$37,051,954	\$38,271,961	\$15,032,000

*SAM Multipliers*

Sources: IMPLAN modeling results; \* Stynes, Daniel J., 2008, National Park Visitor Spending and Payroll Impacts 2007, for the National Park Service, Social Science Program. For information on SAM multipliers see Appendix A, Glossary of Economic Impact Terms.

Table ES2 summarizes the estimates of economic impacts resulting from the money spent in the five-borough region around Katmai NPP during 2007 by visitors to the park and preserve.<sup>3</sup> This study estimates that Katmai NPP visitors spent \$31 million (2007 dollars or \$31.7 million in

<sup>3</sup> The five boroughs included in the model are: Bristol Bay, Kodiak Island, Lake and Peninsula, Kenai Peninsula, and the municipality of Anchorage.

2009 dollars) in the region, with more than a third of that spent inside Katmai NPP. The visitor expenditures generated \$46 million (2007 dollars or \$47.3 million in 2009 dollars) in total output, supported 390 jobs, generated \$15 million (2007 dollars or \$15.2 million in 2009 dollars) in labor income, and added a value of \$23 million (2007 dollars or \$23.94.1 million in 2009 dollars) to the regional economy. This represents nearly two-thirds of the value added to all of the Alaska economy by Katmai NPP visitors in 2007.

Visitors to Katmai NPP spend more per trip in Alaska than other Alaska visitors. While they represent approximately 2% of total visitors to Alaska, they account for 3% of visitor expenditures (Table ES3). The average per person per trip expenditures for visitors in Alaska is estimated to be \$992 (2009\$).<sup>4</sup> In addition to spending more per trip, it is also likely that a higher proportion of Katmai NPP visitor expenditures remains in and benefits the Alaska economy because a high proportion of businesses supporting Katmai NPP visitation are owned and operated by Alaska residents.<sup>5</sup>

**Table ES2. Alternative five-borough local model reducing expenditures un-related to Katmai NPP portion of Alaska visit**

	2007\$\$	2009\$\$
Direct Expenditures i/s Katmai NPP	\$11,942,662	\$12,335,897
Direct Expenditures o/s Katmai NPP in Alaska - weighted for Katmai NPP influence	\$18,793,027	\$19,411,823
	\$30,735,689	\$31,747,721

**IMPLAN Modeling Results:**

Total Industrial Output	\$45,810,790	\$47,319,198
Employment	390	
Labor Income	\$14,672,555	\$15,155,677
Value Added	\$23,357,162	\$24,126,242

*SAM Multipliers*

<sup>4</sup> McDowell Group, DataPath Systems, Davis, Hibbitts & Midghall, Inc., 2007, *Alaska Visitor Statistics Program, Alaska Visitor Volume and Profile, Summer 2006*, prepared for the Alaska Department of Commerce, Community and Economic Development.

<sup>5</sup> National Park Service, Alaska Region, CUA database, operator address and employee information, various years.

**Table ES3. Per group and per person expenditures by visitor type to Katmai NPP**

Expenditures per <b>Group</b> per Trip (2009 dollars)	Day Trip n=152	Day Package n=160	Overnight in Katmai NPP n=129
Expenditures i/s Katmai NPP	\$389	\$1,252	\$2,613
Expenditures o/s Katmai NPP:	\$3,033	\$6,367	\$4,422
Expenditures o/s Katmai NPP (weighted):	\$1,319	\$2,827	\$2,812
Expenditures per <b>Person</b> per Trip (2009 dollars)			
Expenditures i/s Katmai NPP	\$134	\$501	\$1,005
Expenditures o/s Katmai NPP:	\$1,046	\$2,547	\$1,701
Expenditures o/s Katmai NPP (weighted):	\$455	\$1,131	\$1,081

This study of Katmai NPP visitor economic impacts used an approach modified from the more common methods used in the National Park System in order to better account for the unique situation of this remote region. MGM modeling based on visitor surveys of the type administered at Katmai NPP by the University of Idaho (U of I) in 2006 is the standard approach to estimating National Park economic impacts throughout the United States. The MGM approach uses IMPLAN-generated multipliers along with an estimation model developed specifically to capture National Park recreation visitor behavior. However, at Katmai NPP conventional assumptions do not work well, and the authors of this study took a more adaptable approach. This custom economic model derives impact estimates directly from IMPLAN software rather than through the MGM-assisted process. The following observations were made about the Katmai NPP economic modeling process and its use of IMPLAN rather than MGM software:

- The measure of ‘visitor nights’ – defined as ‘nights spent in the local area’ in the MGM modeling process was a problem for the Katmai NPP model. Visitors to the park often spend only one day inside the park and do not typically return after leaving. Most access is by airplane and the night before and / or after the visit is likely to be spent a substantial distance from the park. MGM software develops estimates based on visitor nights in the area; thus accounting for multiple excursions into the park on the same overall visit. The modeling approach at Katmai NPP taken in this analysis uses a ‘visitor trip’ accounting system to more accurately portray visitor flow and expenditures. The length of stay in the local area related to the Katmai NPP trip was difficult to determine from the survey data. However, following a similar approach to that used in MGM modeling, visitor trips and expenditures for the Katmai NPP economic impact model were calculated separately for the three primary types of visitors (single day private, single day package, and multi-day).
- Accurate and complete survey expenditure data is difficult to collect in any study. This was a particularly apparent problem with the Katmai NPP visitor survey. The remoteness of Alaska and its unique adaptations to economic challenges increase the difficulty of measuring expenditures within appropriate categories and attributing them to correct

locations. The Katmai NPP visitor survey collected substantial expenditure data recorded under packages. This is not a standard economic sector or MGM expenditure category and the survey did not collect sufficient information to accurately allocate package expenditures to appropriate economic sectors. In addition to these types of measurement errors, nearly 20% of the survey respondents did not provide any usable expenditure information.

- The U of I Katmai NPP visitor survey included spending categories of packages, guide services, and donations that are not usually measured on standard NPS visitor surveys. These are not standard MGM spending categories and the MGM software did not provide the ability to add them to the model; whereas they could be bridged and margined to economic sectors with the IMPLAN software. If attempts are made to further refine the NPS visitor survey process to better account for differences found in Alaska, it may be necessary to further adapt the spending categories and bridging/margining methods. Unless this type of custom modeling is available within MGM software, it would be advantageous to continue to develop the IMPLAN modeling approach for Alaska National Park units.
- To determine whether the issues related to the MGM model and the U of I survey were confined to remote wilderness parks as opposed to road accessible parks, we reviewed the results of the 2006 Denali National Park and Preserve U of I survey and its applicability to MGM or IMPLAN modeling. We found that the survey administration resulted in a sample that was significantly different from existing Denali NPP data on its visitor population.<sup>6</sup> A large portion of Denali NPP visitors come on package tours which would have been even more confusing to survey respondents and problematic for economic modeling than the Katmai NPP survey. For this reason, the Denali NPP staff chose not to include visitor expenditure questions in the 2006 U of I survey instrument.<sup>7</sup>

In summary, we have three critiques of the use of the MGM modeling process for Alaska national parks:

- the gross MGM approach using secondary data and a standard national model is inadequate and severely underestimates impacts because visitors to Alaska park spend considerably more on average than visitors to lower-48 parks,
- the customized MGM modeling approach is difficult to use in Alaska because the software does not easily allow for adjustments due to Alaska's unique situation, whereas IMPLAN is easier to adapt,
- the U of I survey instrument and sampling method need to be significantly modified for Alaska with more sample points, true random sampling, and Alaska-appropriate questions.

We did not calculate the total economic value of Katmai NPP in this study. Economic value is a measure of the annual amount of money that people would be willing to pay to maintain the existence of the park or any of its component parts or characteristics for all purposes including recreation, habitat for commercial, personal and subsistence fish resources, as well as non-use values.

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<sup>6</sup> Brigham, Fay and Sharfarz, 2006; Brigham, Loeb, Bush and Fay, 2009

<sup>7</sup> Charlie Loeb, Denali NPP planner, personal communication, March 2006.

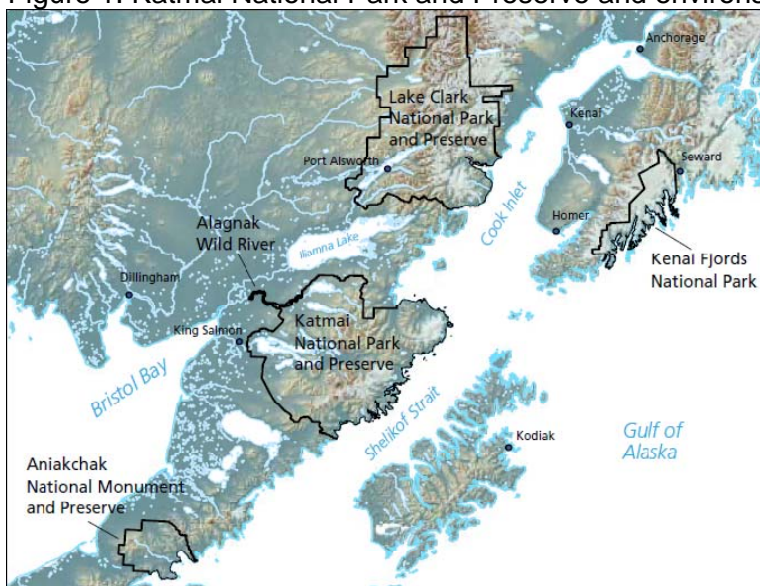
Our measures of expenditures associated with park recreational activities provide a lower bound measure of the total value of the park for recreation since they reflect the amount people actually paid to engage in those activities. Some people probably would have been willing to pay more than they actually did in order to engage in those recreational activities. The total economic value of the park for recreational purposes would be the sum of actual expenditures and this additional willingness to pay. (This additional willingness to pay is also known as the net economic value for recreational purposes.)



## Introduction

Katmai National Park and Preserve is located on the Alaska Peninsula, west of Kodiak Island. Park Headquarters is in King Salmon, about 290 air miles southwest of Anchorage (Figure 1). Katmai National Monument was created in 1918 to preserve the famed Valley of Ten Thousand Smokes, a forty square mile, 100 to 700 foot deep ash flow deposited by the 1912 Novarupta Volcano eruption. In 1931, the monument was expanded to include areas along the Shelikof Strait coastline and in the interior lake system where "there are located features of historical and scientific interest and for the protection of the brown bear, moose, and other wild animals." The Alaska National Interest Lands Conservation Act (ANILCA) created or expanded 13 National Park Units - including Katmai, which became a National Park and Preserve (NPP) on December 2, 1980. ANILCA expanded Katmai NPP to approximately four million acres.<sup>8</sup>

Figure 1. Katmai National Park and Preserve and environs



Source: NPS, Southwest Area Network.

Katmai NPP is becoming best known for its brown bears that congregate at Brooks Falls for the salmon run, as well as in the coastal meadows to feed on rich plant life in the spring. Approximately one-third of visitor days occur at Brooks Camp (Table 1). Another 15% of visitor days occur along the coast, especially Hallo Bay and Geographic Harbor, for late spring and early summer bear viewing; coastal visitation, however, is growing. Estimates of visitor days from Commercial Use Authorization (CUA) permit holder reports averaged 25,000 annually from 2005 through 2007. Estimates based on adjustments for visitors who arrive via their own planes and boats, visit under concession contracts, or are not otherwise required to be reported raises the average to 41,000 visitor days annually.

Sportfishing is also a major draw at Katmai NPP where trophy rainbow trout are found in many lakes and streams as well as grayling, Dolly Varden, sockeye (red) and coho (silver) salmon. Visitation is also influenced by the location of lodges operated under concession contracts,

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<sup>8</sup> U.S. Department of Interior, National Park Service, 1986, *Katmai National Park and Preserve General Management Plan, Land Protection Plan, Wilderness Suitability Review*, November 7, 1986.

located in park in-holdings, and adjacent to the park. Most of these lodges have traditionally been sport fishing lodges offering fly-in fishing throughout the park but now cater to a wider variety of activities. Two wild rivers – the Alagnak and Nonvianuk – provide floating and other recreational opportunities. Other activities in the park and preserve include hiking, kayaking, photography, backpacking, and hunting.

Visitation, both temporally and to specific locations with the park, tends to follow the timing of fish returns which attracts both anglers and bears for viewing. For the park as a whole, peak visitation occurs in July followed by August (Table 2).

Table 1.

Visitor Days by Location Reported by Commercial Use Authorization Permit Holders, 2005-2007

Park Location	2007		2006		2005	
	Visitor Days	Percent	Visitor Days	Percent	Visitor Days	Percent
American Creek	1,546	6%	1,628	6%	1,097	5%
Battle River	620	2%	596	2%	171	1%
Bay of Islands	71	0%	24	0%	51	0%
Big River	177	1%	183	1%	227	1%
Brooks Camp	8,191	32%	8,342	30%	6,932	33%
Contact Creek	115	0%	147	1%	154	1%
Funnel Creek	660	3%	322	1%	28	0%
Geographic/Amalik	1,077	4%	1,092	4%	453	2%
Grosvenor Camp	246	1%	308	1%	224	1%
Hallo Bay	2,727	11%	2,382	8%	1,829	9%
Headwater Creek	66	0%	11	0%	14	0%
Idavain Creek	48	0%	157	1%	67	0%
Kamishak River	666	3%	1,174	4%	731	3%
Kashvik Bay	39	0%	90	0%	14	0%
Kukak Bay	345	1%	664	2%	369	2%
Kukaklek Outlet	1,095	4%	1,353	5%	1,845	9%
Kulik River	2,512	10%	3,445	12%	2,028	10%
Margot Creek	71	0%	167	1%	45	0%
Misty Lagoon			17	0%	63	0%
Moraine Creek	3,083	12%	3,118	11%	3,114	15%
Naknek Lake	39	0%	125	0%		0%
Naknek River	399	2%	84	0%	36	0%
Nanuktuk Creek	403	2%	508	2%	111	1%
Nonvianuk Lake	60	0%	173	1%		0%
Nonvianuk Outlet	277	1%	630	2%	517	2%
Savonoski River	13	0%	52	0%	81	0%
Swikshak Lagoon	271	1%	1,182	4%	522	2%
Valley of 10,000 Smokes	137	1%	30	0%	29	0%
Other	356	1%	163	0%	418	2%
<b>Total All Areas</b>	<b>25,310</b>	<b>100%</b>	<b>28,167</b>	<b>100%</b>	<b>21,170</b>	<b>100%</b>

Source: National Park Service, Alaska Region, Katmai NPP Concession Office, CUA database.

Table 2.

Visitor Days by Month Reported by Commercial Use Authorization Permit Holders, 2005-2007

Month	2007		2006		2005	
	Visitor Days	Percent	Visitor Days	Percent	Visitor Days	Percent
April	24	0%	43	0%		
May	53	0%	611	2%	205	1%
June	4,148	16%	3,990	14%	3,808	18%
July	9,156	36%	8,536	30%	7,477	35%
August	7,297	29%	7,743	27%	5,773	27%
September	4,419	17%	6,752	24%	3,327	16%
October	213	1%	492	2%	580	3%
<b>Total</b>	<b>25,310</b>	<b>100%</b>	<b>28,167</b>	<b>100%</b>	<b>21,170</b>	<b>100%</b>

Source: National Park Service, Alaska Region, Katmai NPP Concession Office, CUA database.

Several commercial airlines provide daily flights into King Salmon as there is no road access. King Salmon is the gateway for trips into the western portion of the park including Brooks Camp and the Valley of Ten Thousand Smokes, accessed by bus from Brooks Camp. Brooks Camp and other locations along the Naknek River drainage can be reached by power boat and float plane from the villages of Naknek and King Salmon. The Katmai NPP Coast is accessed by float and wheeled planes and boat from Homer, Kenai and other Kenai Peninsula communities and Kodiak Island. Primary access to Katmai NPP is small planes landing on lakes, rivers, beaches, and sand bars, which accounts for the widely dispersed visitation patterns despite the lack of road access. Given the range of mountains running between the interior of the park and the coast and the often inclement weather, visiting Brooks Camp and the park interior from the west and the coastal area from the east would normally be on two separate trips into the park.

Visitors to Katmai NPP include both day visitors and overnight visitors; visitors come both guided and unguided. An example of an unguided day visitor is someone who visits for the day at Brooks Camp to fish and/or view bears. This person could fly their own plane or arrive in their own boat or be dropped and picked up by a Commercial Use Authorization permit holder, a commercial business that has permission to operate within the park boundaries. Guided day visitors include people who hire a guide to take them to Hallo Bay for the day to view bears. Overnight visitors stay for at least one night in the park and include people who stay at the campground in Brooks Camp, at one of the lodges in the park, or camp in the back country. Overnight visitors may be guided or unguided.

As a result of the logistical complexities of visiting Katmai NPP, many visitors purchase “packages” for both day and overnight visitation. Typical day packages include transportation to and from the park as well as guide services in the park. Overnight packages typically include transportation to and from the park, meals, lodging and guide services. Many visitors use guide services both for the guides’ local knowledge of fishing and bear viewing locations and because of safety considerations due to the dense population of brown bears. Most visitors are highly motivated to view bears but are unfamiliar with their presence and behavior.

## Purpose

The purpose of this study is two-fold. The first is to conduct an economic impact analysis of visitation to Katmai National Park and Preserve (Katmai NPP). The second and equally important objective is to compare the Money Generating Model (MGM)<sup>9</sup> with other potential models for assessing economic impacts of national parks in Alaska.

The MGM modeling system, which includes a visitor survey administered by the University of Idaho, was designed for national parks in the road accessible “lower 48” states. As a result, applying parameters from other parks or using the system to estimate Alaska economic parameters and/or impacts has been debated because the travel and expenditure patterns of visitors to Alaska parks are quite different. The second objective of this analysis is to address the reliability of using the MGM system in Alaska.

### **Economic Modeling**

The Katmai National Park and Preserve economic impact analysis was conducted in 2009 for the National Park Service (NPS) and National Parks Conservation Association (NPCA) in cooperation with the Institute of Social and Economic Research, University of Alaska Anchorage. The analysis uses existing sources of data to develop estimates of visitation and spending in the local and regional economy. The visitation and spending estimates are used to derive an economic impact model that calculates income, jobs, and total industrial output by sector in the local area.

An economic impact analysis estimates the contribution of tourism activity to the economy of the region. It traces the flows of spending associated with tourism activity in a region to identify changes in sales, tax revenues, income, and jobs due to tourism activity. The principal tools utilized are visitor spending surveys, analysis of secondary data from government economic statistics, economic base models, input-output models and multipliers.<sup>10</sup> A significance analysis estimates the importance or significance of an industry or activity to a region usually including spending by both local residents and visitors from outside the region. This analysis is more accurately an economic significance rather than economic impact analysis because we do not include tax revenues and do not segregate local visitors and those from outside the region. An economic impact or significance analysis does not measure or estimate economic value, such as the value both visitors and non-visitors place on the preservation of fish, wildlife and wilderness within Katmai NPP. For more details on economic impact terminology, see Appendix A. This economic impact model is derived using IMPLAN software.

In contrast, the Money Generation Model (MGM), developed by Dr. Daniel Stynes at Michigan State University, is used nationwide to model economic impacts at National Park Units. According to its developers, the MGM model:

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<sup>9</sup> According to its website, the MGM2 is a set of Microsoft Excel workbooks for estimating the economic impacts of NPS visitor spending on a local region. MGM2 is an update of the NPS Money Generation Model as originally developed by Ken Hornback. Daniel Stynes and Dennis Propst at Michigan State University developed the new version, called MGM2, in 2001. See: <http://web4.msue.msu.edu/mgm2/default.htm>

<sup>10</sup> Frechtling, Douglas C. 1994. Assessing the economic impacts of travel and tourism – Introduction to travel economic impact estimation. In: J.R. Brent Ritchie and Charles R. Goeldner (eds). *Travel, Tourism and Hospitality Research*, 2<sup>nd</sup> ed. New York: John Wiley and Sons Inc.

“estimates the impacts that park visitors have on the local economy in terms of their contribution to sales, income and jobs in the area. The Money Generation Model produces quantifiable measures of park economic benefits that can be used for planning, concessions management, budget justifications, policy analysis and marketing. Refinements to the MGM model make MGM2 more readily applicable to evaluating management, policy and marketing alternatives, both inside and outside the park. Economic impact information has proven quite helpful in fostering partnerships within the community and garnering support for park policies and interests. The economic analysis also helps to identify the roles the park, local community and tourism businesses play in attracting and serving visitors.”

Similar to the IMPLAN model described in this report, the MGM model is an input-output economic model using an IMPLAN base model to calculate industry multipliers in the local economy. The Katmai NPP model described here uses IMPLAN throughout the modeling process for its flexibility to adapt to the unique conditions of Alaska travel and tourism. We had intended to compare Dr. Stynes’ completed MGM model results with our IMPLAN results but they are not yet available. Both modeling processes are based on the same visitor use estimation method and the same visitor characteristic survey data described in this report.<sup>11</sup>

The following documentation describes the process and specific steps used to develop the final Katmai NPP Visitor Impact model. The actual estimation model is contained in a series of worksheets within an Excel project workbook titled Katmai NPP Visitor Impact Model.

### **The 2006 Katmai National Park and Preserve Visitor Study**

Visitor characteristics for this study were estimated using data from a 2006 Katmai NPP visitor survey conducted for the National Park Service Visitor Services Program (Littlejohn and Hollenhorst, 2007). The survey was conducted by the Park Studies Unit, Department of Conservation Social Sciences, University of Idaho (*referred to hereafter as the U of I survey*). It included three sampling periods, instead of the one week total usually used for a U of I survey, during June, July, and August in which attempts were made to sample from the population of visitors in several different locations within Katmai NPP. The survey obtained 507 visitor responses, representing a 74% return rate. The sampling method, though intended to obtain a more representative sample of the population than the usual one week sampling period, was still limited in several ways by the logistics of working in this remote, northern, and mountainous setting. Therefore, while the U of I survey represents the best available data for understanding characteristics of current visitors to Katmai NPP, the reliability of the results is limited by sampling deficiencies. Because of these concerns, the U of I survey data was not used as the primary source of information for visitor estimation within the current study model.

As a result of the unique qualities of the local economy surrounding Katmai NPP, the information about expenditures obtained from the U of I visitor survey is limited in its reliability beyond the problems with visitor sampling. The survey instrument (Appendix B), though well tested in other studies outside of Alaska, produced inconsistent and illogical results. For example, respondents reported spending money on a number of items within Katmai NPP – even though the types of expenditures would most likely have actually been made outside of the park.

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<sup>11</sup> The authors of this report worked cooperatively with Dr. Stynes regarding application of the MGM2 model as well as assisting with visitation estimates.

In addition given of a high percentage of day visits that originate beyond the immediate Katmai NPP area, expenditures were likely to occur in Anchorage or other distant locations. The questionnaire map (Appendix B, survey instrument page 7) used as a reference for survey takers to define the local economic area did not include some of the major trip origin locations such as Kodiak Island and the Kenai Peninsula with the towns of Homer, Soldotna and Kenai. The primary purpose of the survey map was to enable visitors to identify locations within the Park that they visited. As a result, it was inadequate for survey takers to identify the location of trip expenditures and activities in the Park area. A second map of the larger region was not included to help respondents identify where their expenditures occurred. The number of responses for these regional expenditure questions dropped by over half, reflecting this confusion. This hampered the ability to interpret data for assessing economic impacts.

It appears that respondents were somewhat confused about how to report expenditures because of the difficulty of defining the local area and because some of the instructions seemed vague (e.g. – including airfare in “other transportation costs,” when instructions should have been more specific about only including local in-state airfare as opposed to the airfare spent at the visitor’s place of residence to travel to Alaska). These issues resulted in expenditure profiles that did not correspond well with reported lengths of stay in the park, “Katmai NPP area,” or Alaska. The survey category of “package tours (cruise, airline, etc.),” with the greatest amount of spending recorded under any category, presents additional modeling challenges. It is possible that the package expenditures are inflated because some were reported for inside the park or inside Alaska when the payments were actually made for activities outside of those economic areas. In addition, the 'package' category itself is too general to be used for economic impact analysis. The following paragraphs document the steps that were taken to adjust the survey expenditure data for use in the economic impact model. These steps closely follow those used by Dr. Daniel Stynes on the same survey data in preparation for MGM modeling.

The survey data was used to develop estimates for specific components of the visitor volume and economic impact estimation model. Estimates obtained from the survey data include the following visit characteristics:

1. Expenditure group size (survey question # 23c)
2. Length of stay in Katmai NPP (survey question # 12)
3. Group expenditures by category inside Katmai NPP (survey question # 23a)
4. Group expenditures by category outside Katmai NPP but in Alaska (survey question # 23b)
5. Relative role of Katmai NPP in overall Alaska travel plans (survey question # 3)

The original survey data included 507 returned questionnaires. That number of observations was reduced to a set of 441 questionnaires that included complete (or nearly complete) response data across all of the variables needed for this economic modeling project (five questions listed above). The process of cleaning the survey data involved identifying and adjusting extreme outlier values in the group size, length of stay, and expenditure variables within the 441 cases that were used in the modeling. Several of the variable outliers appeared to be the result of data entry errors (e.g. a \$60,000 in-state lodging expenditure was re-coded to \$6,000 after considering the expenditure group’s size and length of stay), while the cause of other outliers was less

obvious. A few of the adjustments resulted from outlier values that may have been accurate but were far above a statistical normal distribution – thus having undue influence on estimates of central tendency. Each adjustment to the survey data is documented in the appendix of this document in the form of the program syntax and explanatory comments from the statistical analysis conducted for this study. Decisions about these adjustments take the same general approach as Dr. Stynes used in his assessment of the U of I Katmai NPP survey data.

The survey data were analyzed by group type to provide more accurate estimates of model parameters and to more closely follow visitor and economic impact estimation methods used throughout the National Park system. The sample size of the survey limited meaningful analysis to three group types: 1) Independent day visitors (sample size = 152); 2) Day visitors reporting package expenditures (sample size = 160); and 3) Combined package and independent overnight visitors (sample size = 129).

There were two group size measures on the U of I visitor survey. Question 18 asked about the number of people in “your personal group,” while question 23c asked for how many people (adults and children) the reported expenses apply to. The average reported expenditure group size was smaller than the average personal group size. The expenditure group size is used for all calculations in the Katmai NPP visitor economic impact model. The exclusive use of this measure provides consistency throughout this study when estimates of visitors and visitor groups are used in calculations. The assumption of using the expenditure group size measure throughout this study is that the behavior of the expenditure group (length of stay, type of lodging, hiring of commercial services, travel method) is more consistent than that of the personal travel group. Interpretation remains straightforward using only the expenditure group size measure as the final model estimates are in terms of visitors rather than visitor groups.

Appendix C contains a suggested re-write of visitor expenditure related questions for a potential Alaska national parks survey that would address a number of these issues. Despite the fact that the U of I survey has received OMB approval, the instrument as written did not provide reliable results for Katmai NPP and is unlikely to perform better at most national parks in Alaska. The survey re-write focuses on four major issues:

- Re-ordering the expenditure and group size questions to reduce respondent confusion;
- Clarification of the difference between “personal travel group” and “expenditure travel group” (or combining them) to make answering expenditure questions easier and provide more consistent data;
- Providing a better map of the park environs to facilitate answering expenditure questions as well as establishing the area of economic influence for economic impact modeling; and
- Dividing independent and “package” expenditures to correspond with Alaska travel and expenditure patterns to provide reliable results that can be used for economic impact modeling.

While the survey revision addresses group and expenditure pattern issues, it does not solve the U of I sample plan issues. A one week sample may or may not be reliable at lower 48 national parks for conducting economic impact analyses depending on how well the limited sample can be adjusted (weighted) to reflect the population of park visitors. Unlike Alaska parks, lower 48

parks may have well-established time series on visitation and visitor profiles from park ranger entrance kiosks and admission data. These data may provide the information to enable reliable statistical adjustments. Given the challenges of estimating visitor numbers and characteristics of Alaska's remote national parks, similar quality visitor data do not exist for making these adjustments. Visitation to Alaska remote parks tends to be sporadic and patchy—this is especially true at Katmai NPP where visitation for bear viewing and sportfishing follows the seasonal movements of bears and availability of fish. In addition, given the predominance of air access to the parks, entry points are almost infinite. Alaska weather can also interrupt visitation for days or weeks at a time, making a one week sample unreliable for determining visitor profiles and expenditures. Comparison of U of I survey samples with actual visitation at Denali and Katmai National Parks and Preserves (2006) and Kenai Fjords National Park (1999) indicate that the U of I sampling methodology does not result in a sample that reflects park visitation.<sup>12</sup> Although the U of I surveys in these Alaska National Parks resulted in obvious sampling deficiencies, the data were not adjusted to any known population parameters during analysis and reporting of results.

### **Visitor Use Estimation**

Estimates of the total number of visitor groups, visitors, and visitor days that occurred during the economic impact model year of 2007 were derived from several sources of data. The primary source of data for the estimates was the Commercial Use Authorization (CUA) permit system and database that is used by Katmai NPP. The commercial use authorization database is used to store information from annual reports submitted by commercial operators that include the numbers of visitors they transported or guided in the park by month and location within Katmai NPP. Commercial use authorization permits are required for all commercial guiding and/or transportation businesses working within Katmai NPP boundaries. This system has been in place for a number of years but was revised and improved in 2006; it provides a reliable basis for use estimation when supplemented with additional visitor characteristic estimates. The permit system collects data on a visitor day basis – a visitor day is reported for each day (either partial or full 24 hour) that a visitor uses a commercial guiding or transportation service.<sup>13</sup>

Visitor use estimates were developed from the CUA data by applying parameter estimates obtained from the U of I visitor survey data for average group size and average length of stay in the park. The estimates were also adjusted to account for visitors to Katmai NPP that are not required to be reported for all or part of their stay in the park. These adjustments are included on the Visitor Count Adjustment worksheet in the Katmai NPP Visitor Impact Excel workbook (please see the worksheet for more details). The following adjustments were made to the visitor estimation to account for non-commercial use permitted visitor days:

1. Visitors that use private transportation to get to Katmai NPP and who do not hire a commercial guide while in the park and preserve would not be reported in the system for

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<sup>12</sup> Brigham, Tom, Charles Loeb, Robert Bush and Ginny Fay, 2009, Denali Park Road Alternatives for Vehicle Management, prepared for the National Park Service, Denali National Park and Preserve.  
Fay, Ginny and Stephen Colt, 2007, Southwest Alaska Network Long-Term Visitor Use Monitoring Protocol Development, Final Report, prepared for National Park Service, Southwest Alaska Network, Inventory and Monitoring Program, October 11, Contract Agreement Number: CA9088A0008.  
Authors' calculations.

<sup>13</sup> Fay, Ginny and Stephen Colt, 2007.



any portion of their trip. Based on U of I survey results, the calculated rate for this type of situation is 8% of day trip groups, 5% of day package groups, and 4% of overnight groups (accounting for 17% of overnight group visitor days).

2. Visitors that go to the coastal area and are dropped off by commercial operators below the mean high tide line do not generate a CUA reported visitor day for that transportation. Ranger observations of below high tide drop-offs at Silver Salmon Creek in Lake Clark NPP indicate 27% of the visitors to that area are not reported for that reason. These observations represent the best available data for the situation on the nearby coast of Katmai NPP, and it is assumed in the estimation model that 25% of coastal area visitors at Katmai NPP are dropped off by commercial operators below high-tide. The calculated rate for this situation overall is 9% of independent day visitor groups, 12% of day package groups, and 4% of the overnight groups – 16% of their visitor days.
3. Unguided visitors that stay more than two days in the park generate a CUA reported visitor day for the first and last days of their trips if they use commercial transportation to get to and from Katmai NPP. If they do not hire a commercial guide or service while on their trip inside Katmai NPP there would be no visitor day counts for the middle days of their trip.<sup>14</sup> It is estimated from U of I visitor survey data that 21% of the visitor days for the overnight groups are un-reported for this reason.
4. Hunters using packages with Katmai NPP concession operators and anglers using sport fishing American Creek concession contractors were added based on 2007 concession use reported figures. There were an additional 140 package hunter visitor days and 869 Katmai American Creek visitor days added to overnight visitor use figures based on these data. Prices for these hunting and fishing packages were based on 2009 advertised prices adjusted to 2007 dollars. Hunter characteristics cannot be estimated from U of I survey data because the seasonal hunts were outside the survey sampling periods.

The group characteristic parameter estimates and the adjustments to CUA reported visitor counts described above are used to develop separate use estimates for each of the three types of visitors identified in the U of I visitor survey data. The visitor use estimate calculations are performed on the Visits worksheet within the Katmai NPP Visitor Impact workbook. The calculations show that for the 2007 impact model year 18% of day trip user days, 17% of day package user days, and 54% of overnight user days were not counted in the CUA system. The CUA count for 2007 was derived from the CUA database in a report of user days by month. That report is included in the Katmai NPP Visitor Impact workbook as a worksheet titled Katmai CUA UD by Month. Applying the under-count rates to the count of 25,310 CUA visitor days and adding the additional hunter and fishing package days leads to an overall estimate of 22,792 visits and 40,908 visitor days at Katmai NPP during 2007. These estimates are summarized in the Table 3 taken from the Visits and Visitor Model worksheets.

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<sup>14</sup> The Katmai and Lake Clark NPP CUA reporting system requires CUAs to report days and number of visitors they accompany visitors to the parks. Past and current CUA data undercounts unguided overnight visitors because unguided visitors are only reported when they are dropped off and picked up. For example, actual visitor days for an eight day, three people unguided group trip would be 24 visitor days. In contrast, an accurate, incompliance CUA activity report of the same party would be six visitor days—three on the day the party was dropped off and three when picked up. So CUA reporting would under count the actual visitor day by 400 percent in this example.

**Table 3. Visitor Use Estimation, Katmai National Park and Preserve, 2007**

Visitor Use Estimation - 2007	Total	Day Trip n=152	Day Package n=160	Overnight in Katmai NPP n=129
Visits in 2007:	22,792	8,449	7,666	6,677
Visitor Days in 2007:	40,908	8,449	7,666	24,793
Expenditure Group Size		2.9	2.5	2.6
LOS - days in park		1.0	1.0	3.7
Reported visitors	14,300	5,360	4,863	4,078
Reported visitor days	25,310	5,360	4,863	15,087
Total rate of unreported visitor days		18%	17%	54%

Source: Author estimates based on Katmai NPP CUA database and UI Survey data.

### Visitor Expenditure Estimation

The Katmai NPP Visitor Impact model develops estimates of visitor spending profiles for each of three visitor types from the U of I visitor survey data. The survey instrument collected spending information for expenditure travel groups across 11 categories of goods and services (question 23). The survey question also asked respondents to distinguish between expenditures made inside Katmai NPP and those made on the trip elsewhere in Alaska. The categories that were used on the survey are generally of the standard type used on visitor surveys – especially those designed to inform the economic impact modeling of National Park visitors using the MGM protocols. The standard spending categories, as they appeared on the Katmai NPP visitor survey, include: “Lodge/hotel/motel/cabins, B&B, etc.,” “Camping fees and charges,” “Restaurants and bars,” “Groceries and takeout food,” “Gas and oil (auto, RV, boat, etc.),” “Other transportation expenses: (including airfare),” “Admission, recreation, entertainment fees,” and “All other purchases (souvenirs, film, books, sporting goods, clothing, etc.).”

Three additional categories were included in the U of I Katmai NPP survey that are not part of the standard MGM design. They were “Package (cruise, airline, etc.),” “Guide fees and charges,” and “Donations.”

The survey expenditure categories must be allocated to existing economic sectors to enable the use of the expenditure data in detailed economic impact analysis in the Katmai NPP Visitor Impact model. The “package” category is too general for allocation to economic sectors so expenditures reported within that category were re-assigned to nine other survey expenditure categories (all remaining categories except 'all other purchases'). The re-assignment of package expenditures was based on spending profiles of day and overnight visitors that did not report package expenses – i.e. package expenditures for day visitors were re-allocated according to the spending profiles of non-package day visitors while package expenditures for those staying overnight in Katmai NPP were re-allocated according to the spending profiles of other overnight respondents (Tables 4 and 5). The following table illustrates the changes to the day package, Alaska regional spending profile resulting from this adjustment procedure.

**Table 4. Adjusted spending profiles from package visitation to Katmai NPP**

Adjusted Spending Profile for Packages

	Day Trip	Day Package	Adjusted Day Package
Package tour (cruise, airline, etc.)		58%	
Lodge/hotel/motel/cabins, B&B, etc.	31%	12%	29%
Camping fees and charges	1%	1%	1%
Guide fees and charges	10%	2%	9%
Restaurants and bars	10%	6%	12%
Groceries and takeout food	3%	2%	4%
Gas and oil (auto, RV, boat, etc.)	7%	3%	7%
Other transportation expenses: (including airfare)	26%	11%	29%
Admission, recreation, entertainment fees	4%	2%	4%
All other purchases (souvenirs, film, booksÉ)	8%	3%	3%
Donations	0%	0%	0%
	100%	100%	100%

The resulting spending profiles are included on the Expenditures worksheet of the Katmai NPP Visitor Impact workbook. Spending profiles are listed in the survey categories as percentages of the total per group per trip. Total amounts per group per trip are listed on the Expenditures worksheet in 2006 dollars (the year of the survey data). All profiles and amounts are calculated separately for each of the three group types (Day Trip, Day Package, and Overnight) and for spending that was reported inside Katmai NPP and outside Katmai NPP in the rest of Alaska.

Expenditure Estimates Reduced by Weighting. Two sets of estimates were developed for the expenditures occurring outside of Katmai NPP. The first set of estimates used all of the reported outside expenditures while the second, more conservative set of estimates are weighted according to survey responses about the relative role of Katmai NPP in overall Alaska trip plans.

Ideally, question number 6b of the U of I survey would have provided data on the total length of the visitors' trip to Alaska, the number of those days spent in the Katmai NPP area and the number of those days spent inside the park. However, similar to other questions that referenced the survey page 7 map, respondents appeared confused by this question and gave inconsistent responses. This question would have allowed more accurate weighting of the portion of expenditures to the Park, local Park region and statewide.

As a result of the confusion with question 6b, question 3 was used as an alternative for weighting of expenditures. U of I visitor survey question 3 asked about how the visit to Katmai NPP fit into overall travel plans, with visitors having three categorical response choices: "Katmai NP & Preserve was the primary destination," "Katmai NP & Preserve was one of several destinations," or "Katmai NP & Preserve was not a planned destination." Weights of 1.00, 0.50, and 0.25, respectively, were arbitrarily assigned to outside Katmai NPP expenditures according to the response to survey question 3 in order to develop a set of more conservative economic impact estimates. The purpose of the weighting is to more accurately "credit" Katmai NPP visitor expenditures made outside Katmai NPP but during their trip to Alaska. If a visitor came to Alaska primarily to visit Katmai NPP, then all their Alaska expenditures are "credited" to

Table 5 shows visitor expenditures and expenditure profiles from the Katmai NPP Visitor Impact Model Expenditure worksheet.

**Table 5. Expenditures per group per trip, Katmai NPP, 2007**

Expenditures per Group per Trip (2006 dollars)	Day Trip n=152	Day Package n=160	Overnight in Katmai NPP n=129
Expenditures i/s Katmai NPP	\$366	\$1,178	\$2,460
Expenditures o/s Katmai NPP:	\$2,855	\$5,992	\$4,162
Expenditures o/s Katmai NPP (weighted):	\$1,241	\$2,661	\$2,647
<b>Inside Katmai NPP Spending Profile:</b>			
Lodge/hotel/motel/cabins, B&B, etc.	3%	6%	22%
Camping fees and charges	0%	0%	4%
Guide fees and charges	26%	23%	4%
Restaurants and bars	5%	5%	11%
Groceries and takeout food	1%	1%	2%
Gas and oil (auto, RV, boat, etc.)	5%	6%	1%
Other transportation expenses: (including airfare)	48%	51%	51%
Admission, recreation, entertainment fees	7%	6%	2%
All other purchases (souvenirs, film, books...)	3%	1%	2%
Donations	0%	0%	0%
<b>Outside Katmai NPP Spending Profile (unweighted):</b>			
Lodge/hotel/motel/cabins, B&B, etc.	35%	34%	28%
Camping fees and charges	1%	1%	1%
Guide fees and charges	8%	7%	5%
Restaurants and bars	11%	13%	10%
Groceries and takeout food	3%	4%	4%
Gas and oil (auto, RV, boat, etc.)	7%	8%	4%
Other transportation expenses: (including airfare)	23%	24%	36%
Admission, recreation, entertainment fees	3%	4%	3%
All other purchases (souvenirs, film, books...)	9%	4%	9%
Donations	0%	0%	0%
<b>Outside Katmai NPP Spending Profile (weighted):</b>			
Lodge/hotel/motel/cabins, B&B, etc.	34%	33%	26%
Camping fees and charges	1%	1%	1%
Guide fees and charges	7%	6%	4%
Restaurants and bars	12%	14%	9%
Groceries and takeout food	3%	4%	4%
Gas and oil (auto, RV, boat, etc.)	7%	8%	4%
Other transportation expenses: (including airfare)	24%	25%	39%
Admission, recreation, entertainment fees	4%	4%	3%
All other purchases (souvenirs, film, books...)	10%	4%	9%
Donations	0%	0%	0%

Katmai NPP. On the other end of the spectrum, if the Katmai NPP was unplanned, less of the visitor's expenditures outside the park can be attributed to Katmai NPP. The conservative profiles were later used to model economic impacts in the local area around Katmai NPP, while the full outside spending profiles were used to calculate statewide economic impacts. Survey question 3 and the arbitrary weighting system was used rather than a statistic-based weighting system reflecting time spent in Katmai NPP as a percentage of total time spent in Alaska because data analysis suggested that the U of I survey collected unreliable data on length of stay (question 7, Appendix B).

### **Economic Impact Modeling**

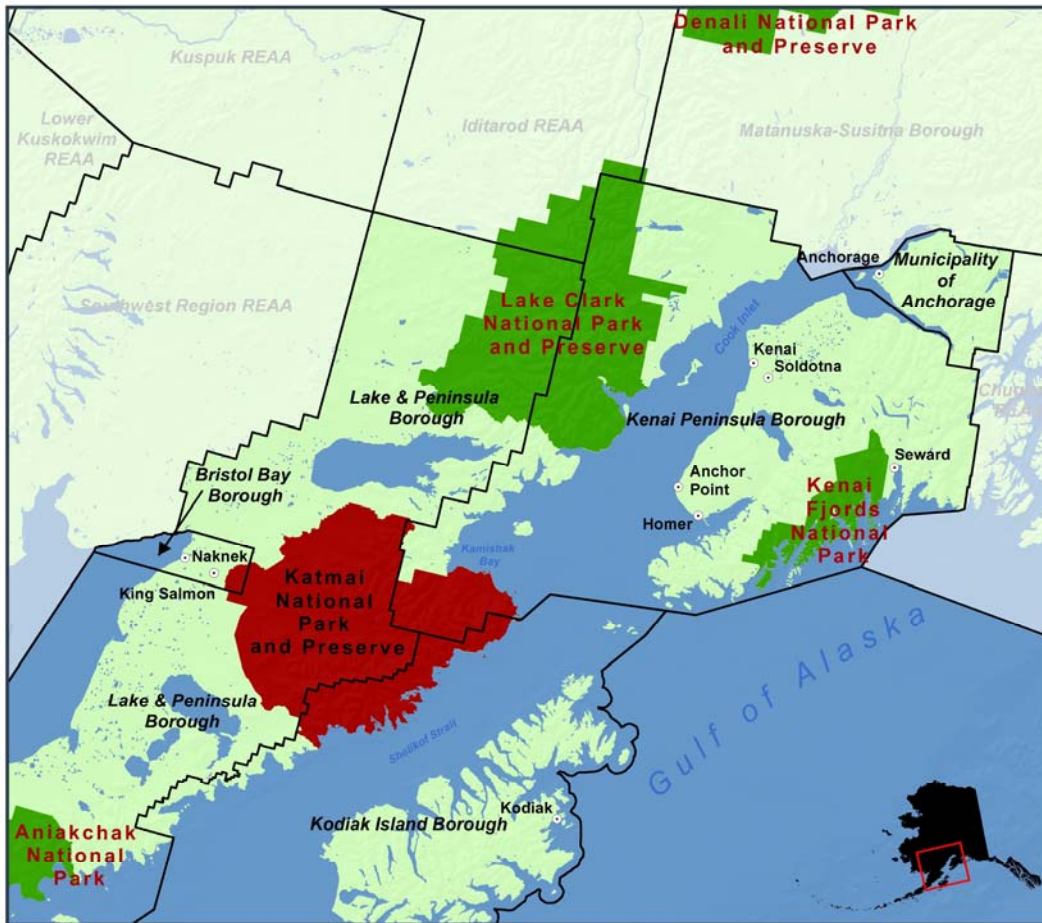
The estimates of total visitors and visitor group spending profiles described above are used to model economic impacts resulting from annual visitation to Katmai NPP. The economic impacts are modeled at two geographic scales. First, an overall model was constructed that represents spending and impacts statewide in Alaska resulting from visitors to Katmai NPP. Second, a more localized model was constructed that uses a weighted set of expenditures and assesses impacts within the five boroughs that encompass Katmai NPP. These include the Municipality of Anchorage and the Bristol Bay, Kodiak Island, Lake and Peninsula, and Kenai Peninsula Boroughs (see Figure 2 for the locations of these boroughs relative to the Park).<sup>15</sup> The smaller scale model more accurately assesses impacts directly related to the Katmai NPP visit while the larger model measures the economic impact of Katmai NPP visitors to the Alaska economy regardless of whether the expenditures occurred during the Katmai NPP portion of the trip to Alaska.

Aggregating Expenditure Data. The first step in the modeling process was to aggregate the spending and visitor estimates into total annual spending profiles. The process was conducted separately for package day, independent day, and overnight visitor types before aggregating the totals. The estimated total number of visitors was divided by the average group size for that group type and then multiplied by the average per-group-per-trip spending profiles to determine total annual spending. The results are calculated on the Impacts worksheet based on the spending inputs from the Expenditures and Visits worksheets described above. Table 6 shows the aggregated annual spending profiles for all of Alaska and for the smaller five-borough region. The results reported in this table are intermediate in the modeling process and required further adjustments described below before being valid estimates of total spending.

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<sup>15</sup> The Municipality of Anchorage functions similarly to a borough, which are similar to counties in other states.

**Figure 2. Five borough boundary region for economic impact assessment**



Bridging and Margining Spending Data. Following aggregation, total spending profiles were matched to appropriate IMPLAN sectors. This process included the bridging from spending categories to IMPLAN sectors and then margining consumer dollars to reflect the producer dollars required for economic impact modeling. The bridging and margining process allocated the 10 spending categories to 16 IMPLAN sectors. The IMPLAN software was then used to construct complete margins from the 16 sectors that reflect the local economy. Based on our knowledge of the Alaska economy, sectors were adjusted to reflect Alaska rather than national production functions. The following table shows the results of this step. Expenditures were entered into the model in their original 2006 base-year amounts, and each sector was adjusted

**Table 6. Estimated aggregate spending for 2007 visitors to Katmai NPP**

Survey Spending Category	Total annual expenditures while in Alaska by visitors to Katmai NPP*	Total annual expenditures in the local five-borough region by visitors to Katmai NPP*
Lodge/hotel/motel/cabins, B&B, etc.	\$13,724,382	\$7,352,320
Camping fees and charges	\$760,941	\$472,736
Guide fees and charges	\$3,789,926	\$2,434,585
Restaurants and bars	\$5,425,452	\$3,142,935
Groceries and takeout food	\$1,594,295	\$885,027
Gas and oil (auto, RV, boat, etc.)	\$2,777,756	\$1,431,724
Other transportation expenses: (including airfare)	\$15,762,138	\$11,139,419
Admission, recreation, entertainment fees	\$1,767,125	\$1,104,530
All other purchases (souvenirs, film, books...)	\$2,622,553	\$1,508,557
Donations	\$149,511	\$95,937
	\$48,374,080	\$29,567,771

\* This is an intermediate modeling table with survey-year 2006 dollars and model-year 2007 visitation levels

separately within the model to reflect 2007 model-year results. Each of the 10 bridging/margining steps is described here with the results shown in table 7. The steps are described in ascending order of their primary IMPLAN sector numbers. Sectors follow the conventional order from manufacturing to wholesale, transportation, retail, service, and government, respectively as numbers increase.

1. Purchases reported on the visitor survey under “**Gas and oil (auto, RV, boat, etc.)**” were bridged and margined by modifying an existing Personal Consumption Expenditure or PCE included with the IMPLAN model for this type of purchase. The following steps were used:
  - a. The purchase was treated as a retail good and a standard built-in household margin was applied to allocate percentages going to retail, wholesale, transportation, and manufacturing sectors. The PCE allocates 98% of the producer price of this purchase to IMPLAN sector 115 ‘petroleum refining’ and 2% to IMPLAN sector 118 ‘Lub., Oils, greases.’
  - b. The IMPLAN model built-in household margins were applied and then the retail and wholesale margins were manually adjusted to better reflect the actual economy, following the methods and data used by Dr. Stynes in the MGM model. Gas station purchases within this PCE were margined at 8% wholesale and 31% retail (*retail margins were reported by Dr. Stynes from Census of Retail trade, 1996. BR/97-RV. Current Business Reports. Annual Benchmark Report for Retail Trade, January 1988 through December 1997; and wholesale trade margins from Annual Benchmark Report for Wholesale Trade, January 1988 through December 1997*).

- c. All sectors linked to the gas and oil purchase, other than retail, used the model local purchasing coefficient (LPC) to determine the amount of immediate leakages from the local economy. All retail and service purchases in the Katmai NPP model were re-set to an LPC of 1.00 to indicate that the purchase occurred entirely locally. The built-in model LPCs of the linked industries (wholesale, transport, manufacturing etc.) were left unchanged, and reflect the limitations of local supplies.
2. Purchases recorded under “**Groceries and takeout food**” required the following adjustments:
  - a. Bridged as a typical basket of goods purchased from ‘Food and beverage retail stores’ (IMPLAN sector 324).
  - b. The standard household margins were applied and the retail margin was adjusted to 38% as described in step 1. The wholesale margin was not adjusted for this or the remainder of retail commodities because that adjustment is not available in a retail sector household margin within the IMPLAN model. Only gas and oil purchases which used a PCE margining method applied a modified wholesale margin.
  - c. The LPC for the retail portion of the groceries purchase was set to 1.00.
3. Purchases under the general retail category of “**All other purchases (souvenirs, film, books, sporting goods, clothing, etc.)**” were adjusted in several ways:
  - a. The general purchases were first re-allocated across clothing, sporting, and general merchandise retail stores in a split of 20%, 20%, and 60%, respectively. The split between the three major retail store sectors represent estimates based on the experiences of the authors of this economic impact study.
  - b. The re-allocated purchases were margined as typical baskets of goods, expressed in purchaser prices, using standard household margins. Retail margins were adjusted to 58% for clothing, 46% for sporting goods, and 61% for general merchandise using data provided by Dr. Stynes.
  - c. The LPCs for the retail margins were set to 1.00. Linked sectors retained the model LPCs.
4. Purchases recorded on the visitor survey under the category of “**Other transportation expenses: (including airfare)**” were adjusted as follows:
  - a. The general transportation purchases were first re-allocated across air, water, and passenger ground transportation types using an 85%, 10%, and 5% split. The split between the three major passenger transportation service sectors is an estimate based on the experience of the authors of this study.
  - b. This type of purchase is for a service, with expenditures recorded directly in producer prices. Therefore, margins are not needed for visitor purchases of services.
  - c. The LPCs for visitors’ purchases of services were all set to 1.00.



5. Purchases recorded under “**Guide fees and charges**” were bridged directly to IMPLAN service sector ‘Scenic and sightseeing.’ No margins were applied to the expenditures. The LPC was set to 1.00.
6. Visitor purchases of “**Admission, recreation, entertainment fees**” were bridged directly to the IMPLAN service sector ‘Amusement, gambling, rec.’ Consumer-to-producer price margins are not needed because services are ‘produced’ at the point of sale. As with other service sector expenditures, the LPC was set to 1.00.
7. Visitor purchases recorded as “**Lodge/hotel/motel/cabins, B&B, etc.**” were bridged to the ‘Hotel’ sector (IMPLAN sector number 411). No margins were applied and the LPC was set to 1.00.
8. Purchases of “**Camping fees and charges**” were bridged to IMPLAN service sector 412 – ‘Other accommodations.’
9. Purchases recoded as “**Restaurants and bars**” were bridged to the ‘Food services’ IMPLAN sector.
10. “**Donations**” were bridged and split between IMPLAN service sectors of ‘Donations – advocacy’ and ‘Donations – organizations’ using a 70% / 30% split. The split was estimated from the authors’ first-hand knowledge.

The following table summarizes the allocation, bridging, and margining process described above. The results reported in this table are intermediate in the modeling process and require further adjustments described below before being valid estimates of total spending.

**Table 7. Allocation, bridging and margining expenditure data for IMPLAN analysis**

IMPLAN sector name	2007 IMPLAN sector number	Basis	Margin	Allocation from survey category	Total annual expenditures while in Alaska by visitors to Katmai NPP*	Total annual expenditures in the local 5-borough region by visitors to Katmai NPP*
Petroleum refining	115	Commodity	household	98%	\$2,714,312	\$1,399,023
Lubricating Oils and Greases	118	Commodity	household	2%	\$63,444	\$32,701
Food and bev stores	324	Commodity	household		\$1,594,295	\$885,027
Clothing retail	327	Commodity	household	20%	\$524,511	\$301,711
Sporting goods retail	328	Commodity	household	20%	\$524,511	\$301,711
General merchandise retail	329	Commodity	household	60%	\$1,573,532	\$905,134
Air transport	332	Industry		85%	\$13,397,817	\$9,468,506
Water transport	334	Industry		10%	\$1,576,214	\$1,113,942
Passenger ground transport	336	Industry		5%	\$788,107	\$556,971
Scenic and sight seeing	338	Industry			\$3,789,926	\$2,434,585
Amusement, gambling, rec	409	Industry			\$1,767,125	\$1,104,530
Hotels	411	Industry			\$13,724,382	\$7,352,320
Other accom	412	Industry			\$760,941	\$472,736
Food services	413	Industry			\$5,425,452	\$3,142,935
Donations - advocacy	424	Industry		70%	\$104,658	\$67,156
Donations - organizations	425	Industry		30%	\$44,853	\$28,781
					\$48,374,080	\$29,567,771

\* This is an intermediate modeling table with survey-year 2006 dollars and model-year 2007 visitation levels

Economic Impact Modeling. The results of the bridging and margining process described in the previous section were used as input to model the economic impacts of Katmai NPP annual visitation activity on the local and regional economies in Alaska. The economic impact model was developed using IMPLAN software and its design closely follows that of the MGM modeling approach. Each of the total annual expenditure amounts listed in the table were added to an IMPLAN economic estimation model as an economic ‘event,’ with the aggregate of the 16 events in the table representing total annual Katmai NPP visitation activity. The dollar amounts for each event were entered in the model in their original 2006 dollar form. The IMPLAN modeling software adjusted the expenditures to model-year 2007 dollars using sector-specific deflators. The resulting impact estimates and visitation estimates are both representative of the same 2007 model year. Estimates for future years can be developed in the model by applying new CUA data to derive total visitation estimates and then by adjusting the IMPLAN model by applying the appropriate set of price deflators to the new total expenditure estimates.

Economic Impact Estimates. Total economic impacts were estimated from the IMPLAN modeling process based on the annual visitation and economic activity described in the previous

section. The input-output model produced estimates of industrial output, employment, labor income, and value added using SAM-type multipliers.<sup>16</sup> Values for the two impact models based on the size of the local economy are reported in the following tables. The first, and larger of the two sets of estimates, is for the impact to the entire state of Alaska resulting from the money spent in Alaska by visitors to Katmai NPP in one year. The second set of estimates uses a reduced set of expenditures and considers impacts only to the five-borough region of Bristol Bay, Kodiak Island, Lake and Peninsula, Kenai Peninsula, and the Municipality of Anchorage resulting from annual spending by visitors to Katmai NPP. The more localized set of expenditure estimates were reduced by ‘weighting’ them according to the influence of Katmai NPP on respondents’ overall visit to Alaska. The weighting process is described above in the documentation of expenditure estimation. Dollar amounts reported in the tables were adjusted from the 2006-dollar survey year expenditures reported above to 2007-dollar model year estimates compatible with the visitation estimates. The estimates of overall expenditures reported here were inflated to 2007 dollars using an index averaged from IMPLAN sectors 10001 – 10009 household indices. This is for reporting purposes only – a more accurate approach was taken during the actual modeling process where appropriate inflators were applied individually to each spending sector.

Table 8 below shows the estimates of economic impacts resulting from the money spent in Alaska during 2007 by visitors to Katmai NPP. This study estimates that Katmai NPP visitors spent nearly \$50 million (2007 dollars or \$51.2 million in 2009 dollars) in Alaska, with almost one-quarter of that spent inside Katmai NPP. Expenditures occurring inside the park are relatively high for a remote Alaska park because of the location of Brooks Camp, which receives a significant portion of Katmai NPP visitors, and the concession operations at Brooks Camp as well as other locations within the park. The visitor expenditures generated \$73 million (2007 dollars or \$75.5 million 2009 dollars) in industrial output, supported 647 jobs (*average annual jobs, not FTEs*), generated \$23 million (2007 dollars or \$23.9 million in 2009 dollars) in labor income, and added a value of \$37 million (2007 dollars or \$38.3 million in 2009 dollars) to the Alaska economy.

**Table 8. Expenditures in Alaska by visitors to Katmai NPP**

	2007\$\$	2009\$\$
Direct Expenditures i/s Katmai NPP	\$11,942,662	\$12,335,897
Direct Expenditures o/s Katmai NPP in Alaska	\$37,600,245	\$38,838,306
	<b>\$49,542,907</b>	<b>\$51,174,203</b>
<b>IMPLAN Modeling Results:</b>		
Total Industrial Output	\$73,066,210	\$75,472,056
Employment	647	
Labor Income	\$23,102,894	\$23,863,601
Value Added	\$37,051,954	\$38,271,961

*SAM Multipliers*

<sup>16</sup> See Appendix A, Glossary of Economic Impact Terms for information on SAM multipliers.

Table 9 summarizes the estimates of economic impacts resulting from the money spent in the five-borough region around Katmai NPP during 2007 by visitors to the park and preserve. This study suggests that Katmai NPP visitors spent \$31 million (2007 dollars or \$31.7 million in 2009 dollars) in the region, with more than a third of that spent inside Katmai NPP. The visitor expenditures generated \$46 million (2007 dollars or \$47.3 million in 2009 dollars) in total output, supported 390 jobs, generated \$15 million (2007 dollars or \$15.2 million in 2009 dollars) in labor income, and contributed an added value of \$23 million (2007 dollars or \$23.94.1 million in 2009 dollars) to the regional economy. This represents nearly two-thirds of the value added to all of the Alaska economy by visitors to Katmai NPP in 2007. Because Katmai NPP visitors spend more per day while in Alaska, they account for three percent of all visitor expenditures in the state while only representing two percent of the visitors. It is also likely that their expenditures have a greater impact on the Alaska economy because of the relatively high proportion of Alaskan owned and operated businesses supporting Katmai NPP visitors.<sup>17</sup>

**Table 9. Alternative five-borough local model reducing expenditures un-related to Katmai NPP portion of Alaska visit**

	<i>2007\$\$</i>	<i>2009\$\$</i>
Direct Expenditures i/s Katmai NPP	\$11,942,662	\$12,335,897
Direct Expenditures o/s Katmai NPP in Alaska - weighted for Katmai NPP influence	\$18,793,027	\$19,411,823
	<b>\$30,735,689</b>	<b>\$31,747,721</b>
<b>IMPLAN Modeling Results:</b>		
Total Industrial Output	\$45,810,790	\$47,319,198
Employment	390	
Labor Income	\$14,672,555	\$15,155,677
Value Added	\$23,357,162	\$24,126,242

*SAM Multipliers*

## Final Comments

This study of Katmai NPP visitor economic impacts used an approach modified from the more common methods used in the National Park System in order to better account for the unique situation of this remote region. MGM modeling based on visitor surveys of the type administered at Katmai NPP by the U of I in 2006 is the standard approach to estimating National Park economic impacts throughout the United States. The MGM approach uses IMPLAN-generated multipliers along with an estimation model developed specifically to capture National Park recreation visitor behavior. However, at Katmai NPP conventional assumptions do not work well, and the authors of this study took a more adaptable approach. This custom economic model derives impact estimates directly from IMPLAN software rather than through the MGM-assisted process. The following observations were made about the Katmai NPP economic modeling process and its use of IMPLAN rather than MGM software:

<sup>17</sup> National Park Service, Alaska Region, CUA database, operator address and employee information, various years.

- The measure of ‘visitor nights’ – defined as ‘nights spent in the local area’ in the MGM modeling process was a problem for the Katmai NPP model. Visitors to the park often spend only one day inside the park and do not typically return after leaving. Most access is by airplane and the night before and / or after the visit can be spent a substantial distance from the park. MGM software develops estimates based on visitor nights in the area; thus accounting for multiple excursions into the park on the same overall visit. The modeling approach at Katmai NPP taken in this analysis uses a ‘visitor trip’ accounting system to more accurately portray visitor flow and expenditures. The length of stay in the local area related to the Katmai NPP trip was difficult to determine from the survey data. However, following a similar approach to that used in MGM modeling, visitor trips and expenditures for the Katmai NPP economic impact model were calculated separately for the three primary types of visitors (single day private, single day package, and multi-day).
- Accurate and complete survey expenditure data is difficult to collect in any study. This was a particularly apparent problem with the Katmai NPP visitor survey. The remoteness of Alaska and its unique adaptations to economic challenges increase the difficulty of measuring expenditures within appropriate categories and attributing them to correct locations. The Katmai NPP visitor survey collected substantial expenditure data recorded under packages. This is not a standard economic sector or MGM expenditure category and the survey did not collect sufficient information to accurately allocate package expenditures to appropriate economic sectors. In addition to these types of measurement errors, nearly 20% of the survey respondents did not provide any usable expenditure information.
- The U of I Katmai NPP visitor survey included spending categories of packages, guide services, and donations that are not usually measured on standard NPS visitor surveys. These are not standard MGM spending categories and the MGM software did not provide the ability to add them to the model, whereas they could be bridged and margined to economic sectors with the IMPLAN software. If attempts are made to further refine the NPS visitor survey process to better account for differences found in Alaska, it may be necessary to further adapt the spending categories and bridging/margining methods. Unless this type of custom modeling is available within MGM software, it would be advantageous to continue to develop the IMPLAN modeling approach for Alaska National Park units.
- To determine whether the issues related to the MGM model and the U of I survey were confined to remote wilderness parks as opposed to road accessible parks, we reviewed the results of the 2006 Denali National Park and Preserve U of I survey and its applicability to MGM or IMPLAN modeling. We found that the survey administration resulted in a sample that was significantly different from existing Denali NPP data on its visitor population.<sup>18</sup> A large portion of Denali NPP visitors come on package tours which would have been even more confusing to survey respondents and problematic for economic modeling than the Katmai NPP survey. For this reason, the Denali NPP staff chose not to include visitor expenditure questions in the 2006 U of I survey instrument.<sup>19</sup>

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<sup>18</sup> Brigham, Fay and Sharfarz, 2006; Brigham, Loeb, Bush and Fay, 2009.

<sup>19</sup> Charlie Loeb, Denali NPP planner, personal communication, March 2006.

In summary, we have three critiques of the use of the MGM modeling process for Alaska national park:

- the gross MGM approach using secondary data and a standard national model is inadequate and severely underestimates impacts,
- the customized MGM modeling approach is difficult to use in Alaska because the software does not easily allow for adjustments due to Alaska's unique situation, whereas IMPLAN is easier to adapt,
- the U of I survey instrument and sampling method need to be significantly modified for Alaska with more sample points, true random sampling, and Alaska-appropriate questions.

We did not calculate the total economic value of Katmai NPP in this study. Economic value is a measure of the annual amount of money that people would be willing to pay to maintain the existence of the park or any of its component parts or characteristics for all purposes including recreation, habitat for commercial, personal and subsistence fish resources, as well as non-use values.

Our measures of expenditures associated with park recreational activities provide a lower bound measure of the total value of the park for recreation since they reflect the amount people actually paid to engage in those activities. Some people probably would have been willing to pay more than they actually did in order to engage in those recreational activities. The total economic value of the park for recreational purposes would be the sum of actual expenditures and this additional willingness to pay. (This additional willingness to pay is also known as the net economic value for recreational purposes.)

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## **Appendix A**

### **Glossary of Economic Impact Terms<sup>20</sup>**

*Terms are presented in groups within a logical rather than alphabetical order*

**Region** – defines the geographic area for which impacts are estimated. The region is generally an aggregation of one or more counties. In the case of this Katmai NPP analysis, the region is the five boroughs of: Lake and Peninsula, Kenai Peninsula, Kodiak Island, and Bristol Bay Boroughs and the Municipality of Anchorage.

**Sector** is a grouping of industries that produce similar products or services. Most economic reporting and models in the U.S. are based on the North American Industrial Classification system (NAIC code). Tourism is more an activity or type of customer than an industrial sector. While hotels (SIC 70) are a relatively pure tourism sector, restaurants, retail establishments and amusements sell to both tourists and local customers. There is therefore no simple way to identify tourism sales in the existing economic reporting systems, which is why visitor surveys are required to estimate tourist spending.

**Impact analysis** estimates the impact of dollars from outside the region (“new dollars”) on the region’s economy.

**Significance analysis** estimates the importance or significance of an industry or activity to a region usually including spending by both local residents and visitors from outside the region.

**Input-output model** is a representation of the flows of economic activity between sectors within a region. The model captures what each business or sector must purchase from every other sector in order to produce a dollar’s worth of goods or services. Using such a model, flows of economic activity associated with any change in spending may be traced either forwards (spending generating income which induces further spending) or backwards (visitor purchases of meals leads restaurants to purchase additional inputs -- groceries, utilities, etc.). Multipliers may be derived from an input-output model.

**IMPLAN** is a micro-computer-based input output modeling system. With IMPLAN, one can estimate 528 sector I-O models for any region consisting of one or more counties. IMPLAN includes procedures for generating multipliers and estimating impacts by applying final demand changes to the model.

**Final Demand** is the term for sales to final consumers (households or government). Sales between industries are termed intermediate sales. Economic impact analysis generally estimates the regional economic impacts of final demand changes. Tourist spending is one type of final demand.

**Direct effects** are the changes in economic activity during the first round of spending. For tourism this involves the impacts on the tourism industries (businesses selling directly to tourists) themselves.

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<sup>20</sup> Adapted from Stynes, Daniel, *Economic Impacts of Tourism*, no date.



**Secondary effects** are the changes in economic activity from subsequent rounds of re-spending of tourism dollars. There are two types of secondary effects:

**Indirect effects** are the changes in sales, income or employment within the region in backward-linked industries supplying goods and services to tourism businesses. The increased sales in linen supply firms resulting from more motel sales is an indirect effect of visitor spending.

**Induced effects** are the increased sales within the region from household spending of the income earned in tourism and supporting industries. Employees in tourism and supporting industries spend the income they earn from tourism on housing, utilities, groceries, and other consumer goods and services. This generates sales, income and employment throughout the region's economy.

**Total effects** are the sum of direct, indirect and induced effects.

**Multipliers** capture the size of the secondary effects in a given region, generally as a ratio of the total change in economic activity in the region relative to the direct change. Multipliers may be expressed as ratios of sales, income or employment, or as ratios of total income or employment changes relative to direct sales. Multipliers express the degree of interdependency between sectors in a region's economy and therefore vary considerably across regions and sectors.

**Type I multipliers** measure the direct and indirect effects of a change in economic activity. They do not include induced effects while Type II or SAM multipliers do. They capture the inter-industry effects only, i.e. industries buying from local industries.

**Type II multipliers** capture direct and indirect effects. In addition to the inter-industry effects, the Type II also takes into account the income and expenditures of households. The household income and the household expenditures are treated as industries. This internalizes the household sector, including the induced or household spending, effects.

**SAM (IMPLAN Social Accounting Matrix) multipliers** are similar to Type II multipliers and use all information about the institutions selected to be included in the predictive model. If only households are included, all information for industries, factors and households are included.

A **sector-specific multiplier** gives total changes throughout the economy associated with a unit change in sales in a given sector.

**Aggregate multipliers** are based on some assumed initial changes in final demand. An aggregate tourism spending multiplier is based on an assumed distribution of tourist spending across economic sectors.

**Capture rate** is the percentage of spending that accrues to the region's economy as direct sales or final demand. All tourist spending on services within the region is captured, however, tourist purchases of goods is generally not all treated as final demand to the region.

**Purchaser prices** are the prices paid by the final consumer of a good or service. **Producer prices** are the prices of goods at the factory or production point.

For **manufactured goods** the purchaser price = producer price + retail margin + wholesale margin + transportation margin.

For **services**, the producer and purchaser prices are equivalent.

The **retail, wholesale and transportation margins** are the portions of the purchaser price accruing to the retailer, wholesaler, and shipper, respectively. Only the retail margins of many goods purchased by tourists accrue to the local region, as the wholesaler, shipper, and manufacturer often lie outside the local area.

### **Measures of economic activity:**

**Total Industry Output (TIO):** IMPLAN uses input/output accounting to assess the value of production by industry for a calendar year. Output can also be thought of as a value of sales plus or minus inventory. Much of the output associated with National Park visitation is in the form of services (e.g., travel, guides, food, accommodations).

**Sales or output** is the dollar volume of a good or service produced or sold

**Final Demand** = sales to final consumers

**Intermediate sales** = sales to other industrial sectors

**Income** is the money earned within the region from production and sales. Total income includes

Wage and salary income, and

Proprietor's income, rents and profits

**Jobs** or employment is a measure of the number of jobs required to produce a given volume of sales/production. Jobs are usually not expressed as full time equivalents, but include part time and seasonal positions.

**Value Added** is the sum of total income and indirect business taxes. Value added is the most commonly used measure of the contribution of a region to the national economy, as it avoids double counting of intermediate sales and captures only the "value added" by the region to final products.

**Appendix B**  
**2006 Katmai NPP University of Idaho, Visitor Survey**



Social Science Program  
National Park Service  
U.S. Department of the Interior

Visitor Services Project

# Katmai National Park and Preserve

## Visitor Study



**United States Department of the Interior**

NATIONAL PARK SERVICE  
Katmai National Park & Preserve  
P.O. Box 7  
King Salmon, AK 99613

IN REPLY REFER  
TO:

Summer 2006

Dear Visitor:

Thank you for participating in this important study. Our goal is to learn about the expectations, opinions, and interests of visitors to Katmai National Park & Preserve. This information will assist us in our efforts to better manage this site and to serve you, our visitor.

This questionnaire is only being given to a select number of visitors, so your participation is very important! It should only take about 20 minutes after your visit to complete.

When your visit is over, please complete the questionnaire. Seal it with the stickers provided on the last page and drop it in any U.S. mailbox.

If you have any questions, please contact Margaret Littlejohn, NPS VSP Coordinator, Park Studies Unit, College of Natural Resources, P.O. Box 441139, University of Idaho, Moscow, Idaho 83844-1139, phone: 208-885-7863, email: [littlej@uidaho.edu](mailto:littlej@uidaho.edu).

We appreciate your help.

Sincerely,

A handwritten signature in black ink that reads "Troy Hamon".

Troy Hamon  
Acting Superintendent

**DIRECTIONS**

Please have the individual, who was randomly selected from your group, complete the following questionnaire. It should take about 20 minutes. After you have completed the questionnaire, please seal it with the stickers provided and drop it in any U.S. mailbox. We appreciate your help.

**PRIVACY ACT and PAPERWORK REDUCTION ACT statement:**

16 U.S.C. 1a-7 authorizes collection of this information. This information will be used by park managers to better serve the public. Response to this request is voluntary. No action may be taken against you for refusing to supply the information requested. Your name is requested for follow-up mailing purposes only. When analysis of the questionnaire is completed, all name and address files will be destroyed. Thus the permanent data will be anonymous. Please do not put your name or that of any member of your group on the questionnaire. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

**Burden estimate statement:** Public reporting burden for this form is estimated to average 20 minutes per response. Direct comments regarding the burden estimate or any other aspect of this form to Margaret Littlejohn, NPS Visitor Services Project, College of Natural Resources, University of Idaho, P.O. Box 441139, Moscow, ID, 83844-1139; email: littlej@uidaho.edu.

Please go on to the next page →

## Your Visit To Katmai National Park (NP) & Preserve

1. a) Prior to your visit, how did you and your group get information about Katmai NP & Preserve? In the left column below, please check (√) **all** that apply.

\_\_\_\_\_ Obtained no information prior to visit → **Go on to Part b of this Question**

- b) Prior to a future visit, how would you and your group prefer to obtain information about Katmai NP & Preserve? In the right column below, please check (√) **all** that apply.

a) Prior to this visit? (√)	b) Prior to future visits? (√)
-----------------------------	--------------------------------

_____ Previous visits	_____
_____ Friends/relatives/word of mouth	_____
_____ Travel guides/tour books	_____
_____ Maps/brochures	_____
_____ State welcome center/Chamber of commerce	_____
_____ Television/radio programs/videos	_____
_____ Newspaper/magazine articles	_____
_____ Telephone/written inquiry to park	_____
_____ E-mail inquiry to park	_____
_____ Park website: <a href="http://www.nps.gov/katm/">www.nps.gov/katm/</a>	_____
_____ Other websites	_____
_____ Package tour (cruise, airline, etc.)	_____
_____ Charter flight	_____
_____ Other (Please specify below)	_____

a) \_\_\_\_\_ b) \_\_\_\_\_

- c) From the sources checked above, did you and your group receive the type of information about the park that you needed?

\_\_\_\_\_ No                      \_\_\_\_\_ Yes                      \_\_\_\_\_ Not sure



- d) If NO, what type of park information did you and your group need that was not available? Please be specific.

\_\_\_\_\_

2. a) Prior to this visit, were you and your group aware that you would be visiting Katmai NP & Preserve, an area managed by the National Park Service?

\_\_\_\_\_ Yes                      \_\_\_\_\_ No                      \_\_\_\_\_ Not sure

b) Prior to this visit, were you and your group familiar with Katmai NP & Preserve rules and regulations?

\_\_\_\_\_ Yes                      \_\_\_\_\_ No

c) On this visit, did you and your group take a tour with an independent guide (not a park ranger)?

\_\_\_\_\_ Yes                      \_\_\_\_\_ No → **Go on to Question 3**



d) If YES, did your guide explain the park rules and regulations to you and your group?

\_\_\_\_\_ Yes                      \_\_\_\_\_ No

3. How did this visit to Katmai NP & Preserve fit into your travel plans? Please check (√) **only one**.

\_\_\_\_\_ Katmai NP & Preserve was the primary destination

\_\_\_\_\_ Katmai NP & Preserve was one of several destinations

\_\_\_\_\_ Katmai NP & Preserve was not a planned destination

4. On this trip, what was the **primary** reason that you and your group visited the Katmai NP & Preserve/Alaska Peninsula **area** (the area shown on the map on page 7 of this questionnaire)? Please check (√) **only one**.

\_\_\_\_\_ Resident of area (shown on page 7 map) → **Go on to Question 5**

\_\_\_\_\_ Visit Katmai NP & Preserve

\_\_\_\_\_ Participate in bear watching

\_\_\_\_\_ Fishing

\_\_\_\_\_ Other recreation (hiking, backpacking, etc.)

\_\_\_\_\_ Study Alaska Native culture

\_\_\_\_\_ Study natural history

\_\_\_\_\_ Visit friends/relatives in the area

\_\_\_\_\_ Visit other area attractions (besides Katmai NP & Preserve)

\_\_\_\_\_ Business

\_\_\_\_\_ Other (Please specify: \_\_\_\_\_)

5. a) If your group has a member who is not a resident of Alaska, what form of transportation did that person use to **first** arrive in Alaska on this trip?

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**Please go on to the next page →**



5. b) On this trip, what forms of transportation did you and your group use to arrive at Katmai NP & Preserve? Please check (√) **all** that apply.

\_\_\_\_\_ Commercial airplane (purchased a seat on a scheduled flight)  
 \_\_\_\_\_ Commercial charter airplane  
 \_\_\_\_\_ Commercial charter boat/cruise ship  
 \_\_\_\_\_ Personal airplane (circle float or wheeled)  
 \_\_\_\_\_ Personal boat  
 \_\_\_\_\_ Other (Please specify: \_\_\_\_\_)

6. a) On this trip, did you and your group stay overnight **away from home** in Katmai NP & Preserve, the surrounding area shown on the map on page 7 of this questionnaire, or in Alaska?

\_\_\_\_\_ Yes                      \_\_\_\_\_ No → **Go on to Question 7**



- b) If YES, please list the number of nights you and your group stayed in Katmai NP & Preserve and/or in the **area** shown on the map on page 7.

Number of nights in Katmai NP & Preserve \_\_\_\_\_

Number of nights in Katmai NP & Preserve **area** \_\_\_\_\_

Number of nights in Alaska \_\_\_\_\_

- c) and d) In what type of lodging did you and your group spend the night(s)? Please check (√) **all** that apply for inside and outside the park.

	<b>c) Inside park (√)</b>	<b>d) Outside park in area on map (√)</b>
Lodge/motel/cabin/rented condo/home or bed & breakfast	_____	_____
Tent camping in developed campground	_____	_____
Backcountry campsite	_____	_____
Personal seasonal residence	_____	_____
Residence of friends or relatives	_____	_____
Other (Please specify below)	_____	_____

c) \_\_\_\_\_ d) \_\_\_\_\_

- e) On this trip, where did you and your group stay on the night prior to visiting Katmai NP & Preserve?

Nearest city/town \_\_\_\_\_ State \_\_\_\_\_

- f) Where did you and your group stay on the night after leaving Katmai NP & Preserve?

Nearest city/town \_\_\_\_\_ State \_\_\_\_\_

7. For this visit, please check (✓) **all** the sites that you and your group visited in Katmai NP & Preserve. If you did not visit a site, please leave that line blank. Use the map below to help you locate the sites you visited.



- |  |   |
|--|---|
| <input type="checkbox"/> American Creek                | <input type="checkbox"/> Kamishak River/Bay   |
| <input type="checkbox"/> Big River                     | <input type="checkbox"/> King Salmon Interagency Visitor Center (next to King Salmon airport) |
| <input type="checkbox"/> Brooks Camp                   | <input type="checkbox"/> Funnel Creek   |
| <input type="checkbox"/> Kukak Bay                     | <input type="checkbox"/> Kulik River  |
| <input type="checkbox"/> Crosswind Lake/Moraine Creek  | <input type="checkbox"/> Alagnak River  |
| <input type="checkbox"/> Kukaklek Lake                 | <input type="checkbox"/> Nonvianuk Lake   |
| <input type="checkbox"/> Geographic Harbor/Amalik Bay  | <input type="checkbox"/> Lake Camp  |
| <input type="checkbox"/> Hallo Bay                     |   |
| <input type="checkbox"/> Valley of Ten Thousand Smokes |   |
| <input type="checkbox"/> Other (Please specify: _____) |   |

Please go on to the next page →

8. a) On this visit to Katmai NP & Preserve, what activities did you and your group participate in the park (**excluding** Brooks Camp)? Please check (√) **all** that apply.

b) Please check the activities you and your group participated in while at Brooks Camp.

\_\_\_\_\_ Did not visit Brooks Camp → **Go on to Question 11**

	a) Elsewhere in the park (√)	b) At Brooks Camp (√)
Visiting visitor center	_____	_____
Purchasing sales items in visitor center bookstore	_____	_____
Viewing bears	_____	_____
Fishing—catch and keep	_____	_____
Fishing—catch and release	_____	_____
Dayhiking	_____	_____
Attending bear orientation and safety talk	_____	_____
Attending other ranger-led talks or walks	_____	_____
Taking guided tour in park (with guide other than park ranger)	_____	_____
Photography	_____	_____
Staying in lodge	_____	_____
Dining	_____	_____
Picnicking	_____	_____
Boating	_____	_____
Backpacking	_____	_____
Camping	_____	_____
Other activities: (Please specify below)	_____	_____
a) _____		b) _____

9. a) Did you and/or your group attend any informational/interpretive programs that are offered daily at Brooks Camp?

\_\_\_\_\_ No                      \_\_\_\_\_ Yes → **Go on to Question 10**



b) If NO, please check (√) **all** of the reasons that you and/or your group did not attend the interpretive programs.

\_\_\_\_\_ Not interested in interpretive programs → **Go on to Question 10**

\_\_\_\_\_ Subject not interesting

\_\_\_\_\_ Time not convenient

\_\_\_\_\_ Location not convenient

\_\_\_\_\_ Other (Please specify:

\_\_\_\_\_)

10. a) On this visit to Brooks Camp, please indicate how the following elements may have affected your park experience. Please check (√) **one** for each element.

Element	Detracted from	No effect	Added to	Did not experience
Current schedule of ranger programs	_____	_____	_____	_____
Ranger availability	_____	_____	_____	_____
Lack of ranger availability	_____	_____	_____	_____
One-mile walk to access bear viewing platforms	_____	_____	_____	_____
Bears blocking access to facilities	_____	_____	_____	_____
Large number of visitors in park	_____	_____	_____	_____
Small number of visitors in park	_____	_____	_____	_____

b) Please explain any "detracted from" responses to part "a" of this question.

\_\_\_\_\_

\_\_\_\_\_

11. It is the National Park Service's responsibility to protect Katmai NP & Preserve's natural and cultural resources/attributes and visitor experiences that depend on these. How important is the protection of the following to you and your group? Please circle **only one** answer for each resource/attribute/experience.

Resource/attribute/experience	Not important	Somewhat important	Moderately important	Very important	Extremely important
Archeological & historical sites	1	2	3	4	5
Bear watching	1	2	3	4	5
Other wildlife & bird watching	1	2	3	4	5
Fishing	1	2	3	4	5
Native plants	1	2	3	4	5
Native animals	1	2	3	4	5
Clean air	1	2	3	4	5
Clean water	1	2	3	4	5
Scenic views	1	2	3	4	5
Solitude	1	2	3	4	5
Natural quiet/sounds of nature	1	2	3	4	5
Wilderness	1	2	3	4	5

Please go on to the next page →

12. On this visit, how much time did you and your group spend at Katmai NP & Preserve? Please list partial hours/days: 1/4, 1/2, or 3/4.

\_\_\_\_\_ Number of hours **If less than 24 hours**

\_\_\_\_\_ Number of days **If 24 hours or more**

13. a) Please check (√) **all** the visitor services and facilities that you or your group **used** during this visit to Katmai NP & Preserve.

b) Next, for only those services and facilities that you or your group **used**, please rate their importance from 1-5.

c) Finally, for only those services and facilities that you or your group **used**, please rate their quality from 1-5.

<b>a) Used service/facility?</b>	<b>b) If used, how important?</b>	<b>c) If used, what quality?</b>
	1=Not important	1=Very poor
	2=Somewhat important	2=Poor
	3=Moderately important	3=Average
	4=Very important	4=Good
	5=Extremely important	5=Very good

_____ Park brochure/map	_____	_____
_____ Other park brochures/publications	_____	_____
_____ Orientation video program (at visitor center)	_____	_____
_____ Visitor center exhibits	_____	_____
_____ Sales items in the bookstore (visitor center)	_____	_____
_____ Assistance from National Park Service staff	_____	_____
_____ Assistance from concession or guide staff	_____	_____
_____ Ranger-led programs (walks, talks, etc.)	_____	_____
_____ Junior Ranger program	_____	_____
_____ Bulletin boards	_____	_____
_____ Restrooms	_____	_____
_____ Trailside interpretive signs	_____	_____
_____ Access for disabled persons	_____	_____
_____ Website ( <a href="http://www.nps.gov/katm/">http://www.nps.gov/katm/</a> ) used before or during visit	_____	_____

14. a) Please check (✓) the places below that you visited on this trip.

b) For the places you visited, please rate from 1 to 5 how crowded you and your group felt by the number of people present at the following locations. Please circle **only one** answer for each place.

Visit on this trip? (✓)	Not at all crowded	A little crowded	Moderately crowded	Very crowded	Extremely crowded
___ Brooks Camp	1	2	3	4	5
___ Hallo Bay	1	2	3	4	5
___ Geographic Harbor	1	2	3	4	5
___ Moraine Creek	1	2	3	4	5
___ American Creek	1	2	3	4	5
___ Crosswinds Lake	1	2	3	4	5
___ Other (Specify: _____ )	1	2	3	4	5

15. a) On this visit, did you and your group go into the backcountry of Katmai NP & Preserve (backcountry includes all areas other than Brooks Camp developed area and Lake Camp)?

Yes                       No    ➔    **Go on to Question 16**  
 ↓

b) Including this visit, how many times have you gone into Katmai NP & Preserve's backcountry?

Once                       2-4 times                       5 times or more

c) How would you and your group rate the quality of your experience in the backcountry? Please circle **only one** answer.

Very poor               Poor               Average               Good               Very good

d) Is there anything you and your group would like to see changed in the way the backcountry is managed? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Please go on to the next page ➔**

**NOTE:** In this questionnaire, your personal group is defined as anyone you are visiting the park with, e.g. spouse, family, friends, etc. This does not include the larger group that you might be traveling with, e.g. school, church, scout, or tour group.

16. On this visit, were you and your personal group with the following types of groups?

- a) Commercial guided tour group?  Yes  No  
(Do not include Valley of 10,000 Smokes, fishing, or bear viewing tours)
- b) School/educational group?  Yes  No
- c) Other organized group?  Yes  No

17. On this visit, what kind of personal group (not guided tour/school group) were you with? Please check (✓) **only one**.

- Alone  Family
- Friends  Family and friends
- Other (Please specify: \_\_\_\_\_)

18. On this visit, how many people were in your personal group, including yourself?

Number of people

19. For you and your personal group on this visit, please indicate the following. If you do not have information for a group member, please leave that line blank.

	Gender M=male F=female	Current age	U.S. Zip Code or name of country other than U.S.	Number of visits made to this park (including this visit) past 12 months	lifetime
Yourself	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Member #2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Member #3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Member #4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Member #5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Member #6	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Member #7	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>





23. For you and your group, please report all expenditures for the items listed below during this visit to Katmai NP & Preserve (see map on page 7) and in Alaska, other than Katmai. **Please write "0" if no money was spent in a particular category.**

- a) Please list your group's total expenditures inside Katmai NP & Preserve, including Brooks Camp and backcountry lodges, as shown on page 7 map.
- b) Please list your group's total expenditures in Alaska **outside** the park.

NOTE: Surrounding area residents should only include expenditures that were **directly related** to this visit to Katmai NP & Preserve.

	<b>EXPENDITURES</b>	
	<b>a) Inside Katmai NP &amp; Preserve</b>	<b>b) In Alaska outside park</b>
Package tour (cruise, airline, etc.)	\$ _____	\$ _____
<b><u>Please list expenditures not included in the package tour below:</u></b>		
Lodge/hotel/motel/cabins, B&B, etc.	\$ _____	\$ _____
Camping fees and charges	\$ _____	\$ _____
Guide fees and charges	\$ _____	\$ _____
Restaurants and bars	\$ _____	\$ _____
Groceries and takeout food	\$ _____	\$ _____
Gas and oil (auto, RV, boat, etc.)	\$ _____	\$ _____
Other transportation expenses: (including airfare)	\$ _____	\$ _____
Admission, recreation, entertainment fees	\$ _____	\$ _____
All other purchases (souvenirs, film, books, sporting goods, clothing, etc.)	\$ _____	\$ _____
Donations	\$ _____	\$ _____

- c) How many people do the above expenses cover?  
       \_\_\_\_\_ Adults (18 years or over)                      \_\_\_\_\_ Children (under 18 years)

24. a) On this visit, what did you and your group like **most** about Katmai NP & Preserve?

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b) On this visit, what did you and your group like **least** about Katmai NP & Preserve?

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25. If you were a manager planning for the future of Katmai NP & Preserve, what would you propose? Please be specific.

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26. Is there anything else you and your group would like to tell us about your visit to Katmai NP & Preserve?

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27. Overall, how would you rate the quality of the visitor facilities, services, and recreational opportunities provided to you and your group at Katmai NP & Preserve during this visit? Please circle **only one**.

Very poor      Poor      Average      Good      Very good

Thank you for your help! Please seal the questionnaire with the stickers provided and drop it in any U.S. mailbox.

**OFFICIAL BUSINESS**

**Visitor Services Project  
Park Studies Unit  
College of Natural Resources  
University of Idaho  
P.O. Box 441139  
Moscow, Idaho 83844-1139**



**Appendix C**  
**Suggested Re-Write of Visitor Survey Expenditure Questions to Accommodate**  
**Alaska Travel Patterns and Package Expenditures**



5. How did this visit to Katmai fit into your travel plans? Please check (✓) **ONLY ONE**.
- Katmai was the **primary** destination
  - Katmai was **one of several** destinations
  - Katmai was **not a planned** destination
6. Were any nights on this trip spent in the home of a personal group member who lives in Alaska?
- No
  - Yes → How many nights? \_\_\_\_\_
7. (a) Excluding any nights that were spent in a group member's home, did you or anyone in your personal group stay overnight in Katmai NP & Preserve, in the area outside the park that is shown on the map on page X, or elsewhere in Alaska?
- Yes
  - No → **Go to Question 8 on the next page**
- ↓
- (b) If YES, please list the number of nights you or someone in your group stayed in Katmai NP & Preserve, in the area immediately outside the park shown on the map on page X, and in other places in Alaska.
- Number of nights in Katmai NP & Preserve \_\_\_\_\_
- Number of nights in the **area immediately outside the park** \_\_\_\_\_
- Number of nights elsewhere in Alaska \_\_\_\_\_

**[continue with the next page]**

(c), (d), (e) Please write in the number of nights spent and the number of people who stayed in each type of lodging for all nights on this trip.

	<b>(7.c) INSIDE park</b>		<b>(7.d) OUTSIDE park in area on map</b>		<b>(7.e) Elsewhere in Alaska</b>	
	<b>nights</b>	<b>people</b>	<b>nights</b>	<b>people</b>	<b>nights</b>	<b>people</b>
Total number of . . .						
Nightly lodging (motel/cabin/ lodge/hotel/bed & breakfast)						
Tent camping in developed campground						
Backcountry campsite						
Personal seasonal residence						
Residence of friends/relatives						
Other (Please specify below)						
_____						

8. Where did you and your group stay on the night before visiting Katmai?

Nearest city/town\_\_\_\_\_ State\_\_\_\_\_

9. Where did you and your group stay on the night after visiting Katmai?

Nearest city/town\_\_\_\_\_ State\_\_\_\_\_



## PACKAGE TOUR

10. Did you or anyone in your personal group go on any **package tours** that included at least some meals, some lodging, and/or some transportation while on this trip?

Yes                       No → **Go to page 5, Independent Travel**



<b>11a. Did you take package tour(s) to visit . . .</b>	<b>Destination</b>		
	<b>Katmai NP &amp; Preserve?</b>	<b>Other Alaska Location(s)?</b>	<b>Alaska in General?</b>
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

<b>11b. What was included in the package(s)? [Check (✓) ALL THAT APPLY]</b>			
Air transportation			
Ground transportation			
Marine transportation			
Lodging			
Meals			
Guide services			
Fees, such as a fishing license			
Gear, such as tents, other camping equipment, bikes, kayaks			
Admission to events or attractions			
Other (please identify):			
1.			
2.			
3.			

<b>11c. What was the cost per person for the package tour(s)?</b>	\$ _____ per person	\$ _____ per person	\$ _____ per person
<b>11d. How many people in your personal group were on the package tour(s)?</b>	# _____	# _____	# _____

## INDEPENDENT TRAVEL (TRAVEL THAT WAS NOT PART OF A PACKAGE TOUR)

In this section please list expenditures that you did not report as part of a package tour. Report your expenditures for the location where the activity took place, **NOT** where you paid for the activity. For example, you may have paid for your Katmai guide, airfare, groceries, or lodging while in Anchorage or outside Alaska before you arrived, but they would be reported in column (a) expenditures for activities in Katmai.

- 12.** For your expenses and those of your personal group that were **NOT** paid for as part of a package tour, please report how much was spent on activities in each area of the state. **If you no longer have your expenditure receipts, simply estimate your expenditures as closely as possible.** Please write "0" if no money was spent in a particular category.
- (a) The total spent on activities that took place within the Katmai NP & Preserve boundary, including Brooks Camp and backcountry lodges.
  - (b) The total spent on activities that took place in the area on the map that is around Katmai, but not within the park itself.
  - (c) Your group's total expenditures elsewhere in Alaska—that is outside the park and outside its surrounding area.

Total spent on an activity that took place:			
	(a) <i>INSIDE</i> Katmai NP/Preserve	(b) <i>OUTSIDE</i> Katmai in the area on map	(c) Elsewhere in Alaska
<b>Please list expenditures NOT included in your package tours:</b>			
Nightly lodging (motel/cabin/lodge/hotel/bed & breakfast)			
Camping fees and charges			
Guide service fees and charges			
Restaurants and bars			
Groceries and takeout food			
Other tours; e.g., city/sightseeing, day cruise, rafting, riverboat			
Gas and oil for car, RV, boat, plane, etc.			
Transportation expenses: (bus, airfare, ferry, train, rental car, taxi, parking)			
Admission/entrance fees; recreation, entertainment costs			
All other purchases (souvenirs, film, books, sporting goods, clothing, fishing equipment, etc.)			
Donations			
Total spent	\$	\$	\$
Number of adults (18 years and older) covered by these expenses			
Number of children (under 18) covered by these expenses			

Map of Katmai National Park and Preserve and environs



(MAP AND Q 12 ARE ON FACING PAGES)

13. Are there members of your personal group whose expenditures were **NOT** included?

No



[Continue with question 14 below]

Yes → Why were these expenses not included? \_\_\_\_\_

You may use this space and continue on the back, if necessary, to identify members in your personal group (see the chart on page 1) for whom expenses were not included and a brief description of why their expenses were not included.

14. (a) Before taxes and after taking out business expenses, which category best represents **your household's** total income in **20XX**? Please check (✓) **ONLY ONE**.

\$30,000 or less

\$30,001-\$60,000

\$60,001-\$90,000

\$90,001-\$120,000

\$120,001 or more

Do not wish to answer

(b) How many people did this income support in **20XX**? \_\_\_\_\_



(c) How many of these people were on this trip?

\_\_\_\_\_ Adults (18 years +)

\_\_\_\_\_ Children (under 18)