Katmai National Park and Preserve Economic Significance Analysis and Model Documentation

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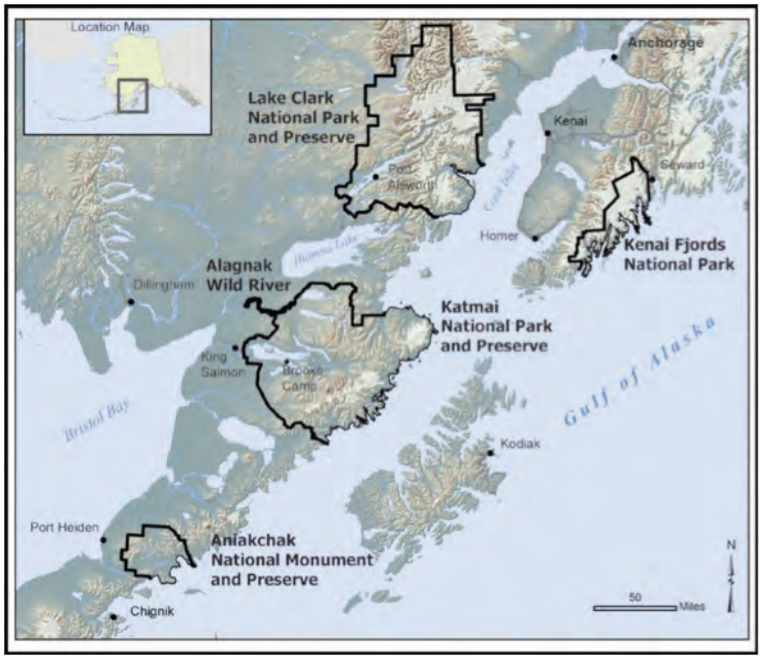
The purpose of this study is twofold. The first is to conduct an economic significance analysis of visitation to Katmai National Park and Preserve (Katmai NPP), using a standard economic input/output model. The second, and equally important, objective is to compare the National Park Service's (NPS) Money Generation Model (MGM; http://web4.msue.msu.edu/mgm2/default.htm) methodology with this more general and adaptable approach (input/output model) to assessing economic significance of national parks in Alaska.

Katmai NPP 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

Figure 1. Katmai National Park and Preserve and environs (source: NPS, Southwest Area Network).



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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 in Katmai NPP occur at Brooks Camp. Another 15% of visitor days occur along the coast, especially Hallo Bay and Geographic Harbor, for late spring and early summer bear viewing; this 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 spatially, tends to follow the timing of fish returns, which attracts both anglers and bears for viewing. For the park as a whole, visitation is highest in July, and second highest in August.

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, wheeled planes, and boat from Homer, Kenai, other Kenai Peninsula communities, and Kodiak Island. Primary access to Katmai NPP is via 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 accomplished during 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 CUA 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.

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 usually 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 1 shows the estimates of economic impacts resulting from the money spent in Alaska by visitors to Katmai NPP, during 2007. This study's model estimates that Katmai NPP visitors spent nearly $50 million (in 2007 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 in total output, supported 647 jobs (average annual jobs, not full time equivalents), generated $23 million in labor income, and added a value of $37 million to the Alaska economy. These values are significantly higher than those generated by the course-scale 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 Alaskan economy through an

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%

Table 1. Case study visitor use estimation, Katmai NPP, 2007.

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 2 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 (Figure 2; model includes five boroughs, Bristol Bay, Kodiak Island, Lake and Peninsula, Kenai Peninsula, and the minicipality of Anchorage). This study estimates that Katmai NPP visitors spent $31 million in the region, with more than a third of that spent inside Katmai NPP. The visitor expenditures generated $46 million in total output, supported 390 jobs, generated $15 million in labor income, and added a value of $23 million to the regional economy. This represents nearly two-thirds of the value added to all of the Alaskan economy by Katmai NPP visitors in 2007.

Table 2. Expenditure margining for IMPLAN analysis of 2007 visitation to Katmai NPP.

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 five-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 merchendise 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 trnsport	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

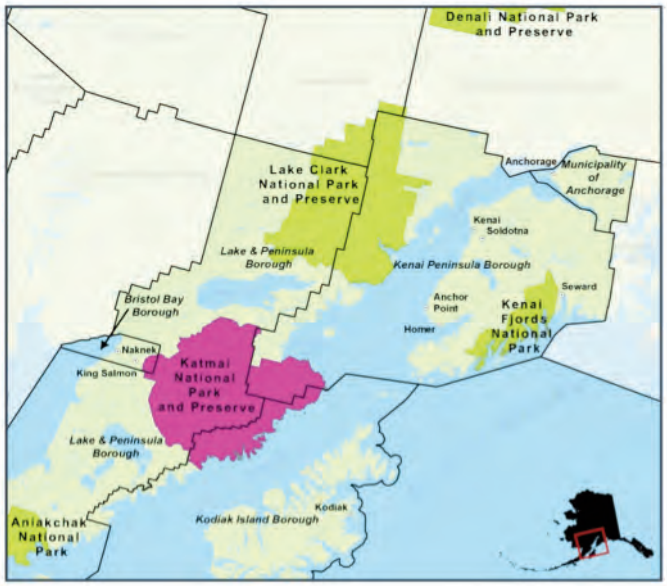

Figure 2. Five borough area of economic significance.

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. The average visitor expenditure per person per trip in Alaska is estimated to be $992 (in 2009 dollars; McDowell Group et al. 2007). 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 (USDI NPS various years).

Our study of Katmai NPP visitor economic impacts used an approach modified from the more common methods used in the NPS, 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 visitor's recreation behavior. However, at Katmai NPP, conventional assumptions do not work well, and we 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 that we took at Katmai NPP uses a 'visitor trip' accounting system to more accurately portray visitor flow and expenditures. The length of stay in the local area, which stemmed from Katmai NPP visits, 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 particularly apparent in 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 on package tour visits. 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 adjust the model sector category 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 (Denali NPP) 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 (Brigham, Fay, and Sharfarz 2006). 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 was. For this reason, the Denali NPP staff chose not to include visitor expenditure questions in the 2006 U of I survey instrument (Charlie Loeb, Denali NPP planner, pers. comm.).

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 parks 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 to fit 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 estimate 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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