Economic Significance Analysis of Visitation to Remote Alaska Public Lands: A Case Study of Katmai National Park and Preserve

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Introduction

Most of the national parks in Alaska present unique challenges to estimating visitor economic impacts because their remoteness significantly alters visitor access and behavior as compared with the norm in most national park regions. Rather than having a kiosk where rangers collect fees and count people as they enter through major portals, most Alaska national parks have an almost infinite number of entry points to which people fly, boat, drive a snow machine, and hike, arriving at remote coastlines, lakes, and rivers. In addition to viewing exceptional scenery and participating in adventure sports, many visitor activities tend to follow seasonal patterns and migrations of fauna and flora; these may include viewing wildlife, fishing, and subsistence gathering. The unique characteristics of visitor behavior and the difficulty of access to public lands in Alaska make the National Park Service's customary visitor use estimation, sampling, and surveying methods statistically unreliable.

The purpose of this paper is to review and suggest improvements to visitor economic impact assessment procedures for remote public lands located within relatively isolated economies. This paper describes how the authors adapted the best available data on visitor numbers, patterns, and expenditures to improve estimates of the economic significance of visitation to a remote national park in Alaska. We describe this adaptable approach through its application in a case study of visitation to Alaska's Katmai National Park and Preserve (hereafter Katmai NPP), but the implications can inform the application of economic impact analysis in other remote public lands as well. The case study evaluates three aspects of current visitor economic impact assessment in Katmai NPP: (1) visitor travel behavior data, (2) visitor use estimation, and (3) economic impact modeling. It also describes a process of adjusting the data and the impact model to address concerns raised by the case study evaluation.

Katmai NPP is becoming best known for its brown bears, which congregate at Brooks Falls for salmon runs as well as in the coastal meadows to feed on rich plant life in the spring.

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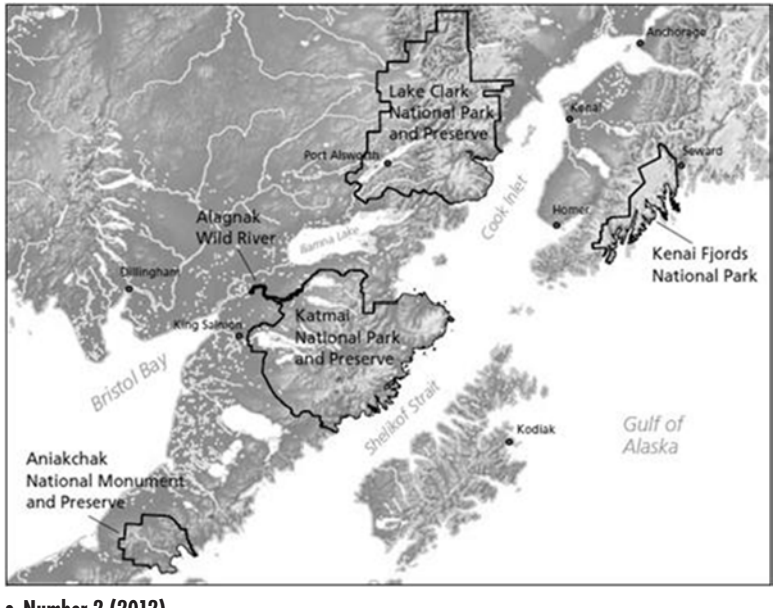
Sport fishing is also a major draw at Katmai NPP, where trophy rainbow trout are found in many lakes and streams, as well as grayling, Dolly Varden, and sockeye (red) and coho (silver) salmon. Two wild rivers, the Alagnak and the Nonvianuk, provide floating and other recreational opportunities. Other activities in the park and preserve include hiking, kayaking, photography, backpacking, and hunting. 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).

King Salmon is the gateway for trips into the western portion of the park, including Brooks Camp and the Valley of Ten Thousand Smokes. Several commercial airlines provide daily flights into King Salmon but there is no road access. 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 Valley of Ten Thousand Smokes is accessed by bus from Brooks Camp. The Katmai NPP coast and interior are accessed by float planes, wheeled planes, and boats originating from Kodiak Island, Homer, Kenai, and other distant communities. This 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 to the park.

As a result of the logistical complexities, many day and overnight visitors purchase inclusive travel packages from commercial 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.

Figure 1. Katmai National Park and Preserve and environs. Source: NPS Southwest Alaska Area Network.



The 2006 Katmai National Park and Preserve visitor study

Katmai NPP visitor characteristics were most recently estimated in 2006 from data collected using a nationally standardized visitor survey conducted for the National Park Service Visitor Services Program. The Park Studies Unit of the University of Idaho's Department of Conservation Social Sciences conducted the visitor survey (Littlejohn and Hollenhorst 2007; hereafter referred to as the U of I visitor survey). To account for major temporal differences in Katmai NPP visitation patterns, the visitor survey procedure used in most national parks was modified to include three sampling periods instead of the one-week standard approach. The 2006 Katmai NPP visitor survey was administered for one week each during June, July, and August, with attempts to sample from the population of visitors in several different locations within the park and preserve. The U of I visitor survey obtained 507 mailback responses from onsite contact information collected during the three sampling periods (representing a 74% response rate).

Visitor survey analysis methods

The U of I visitor survey data were used to develop estimates of the following visit characteristics:

- Size of travel group reporting expenditures together;
- Length of stay in Katmai NPP;
- Expenditures by category inside Katmai NPP;
- Expenditures by category outside Katmai NPP but in Alaska; and
- Relative role of Katmai NPP in overall Alaska travel plans.

The final set of data used in this case study analysis included a subset of 441 of the total of 507 responses to the U of I visitor survey that were sufficiently complete across the five questions about visit characteristics described above. Recognizing that visitor behavior is highly variable, and following standard visitor and economic impact estimation protocols used throughout the national park system, the U of I visitor survey data were analyzed by group type to improve the overall accuracy of the results. The sample size of the survey limited meaningful segmentation 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).

Visitor use estimation

The first challenge of economic significance analysis of Alaska's remote national parks is to obtain accurate visitor use estimates. Given the dispersed nature of entry and the vast size of Alaska's park units, annual reported visitor counts tend to be unreliable. The primary indicator of visitor use at Katmai NPP in this study was the commercial use authorization (CUA) permit system and database that are used by park managers. CUA permits are required for all commercial guiding and transportation businesses working within park boundaries. This system has been in place for a number of years and 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 a full 24-hour period or part thereof) that a visitor uses a commercial guiding or transportation service (Fay and Colt 2007).

Katmai NPP 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 were not required to be reported for all or part of their stay in the park. Use estimates for each of the three types of visitors identified in the U of I visitor survey data were developed from a combination of survey data, CUA data, and ranger observations. The visitor use and behavior estimates developed for the Katmai case study are summarized in Table 1.

Visitor expenditure estimation

Economic impact modeling requires knowledge of the amount of money spent and the types of expenditures that visitors make while in a region of interest. Typically, the economic significance of national parks is estimated based on trip-related spending at multiple geographic scales, which may include: inside the park, within the local park region, and statewide. The U of I visitor survey asked respondents to distinguish between expenditures made inside the park and those made on the trip elsewhere in Alaska.

Expenditure estimates reduced by weighting. The U of I visitor survey's expenditure section was vague in its instructions about recording Katmai NPP trip-related expenditures to the point of causing concern about over-stating the park's influence on the local economy. To address this concern, two sets of estimates were developed for the expenditures occurring outside of Katmai NPP. The first used all of the reported expenditures made in Alaska and outside of Katmai NPP, while the second, more conservative set of estimates was weighted according to survey responses about the relative role of Katmai NPP in overall Alaska trip plans.

Ideally, the U of I visitor survey would have provided data on the total length of the visitors' trip to Alaska, the number of days spent in the Katmai NPP area, and the number of days spent inside the park. However, similar to other questions that referenced the survey map, respondents appeared confused by length-of-stay questions and they tended to give

Table 1. Visitor use estimation, Katmai NPP, 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%

inconsistent responses. Useful data from these questions would have allowed more accurate allocation of the portion of expenditures to the park, local park region, and statewide.

An alternative method for attributing expenditures to the appropriate economy was developed because of confusion over travel length-of-stay questions in the U of I visitor survey. The survey included a question that 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 applied to expenditures recorded outside of the park according to these travel plan responses. The weighted expenditure data were used to develop a set of more conservative economic impact estimates. The purpose of the weighting was 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 were credited to Katmai NPP. On the other end of the spectrum, if their trip to Katmai NPP was unplanned, only a quarter of the visitor's expenditures outside the park were attributed to the park. The more conservative spending 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.

Economic significance modeling

The economic modeling in this case study was used to estimate the overall contribution of tourism activity to the economy of the Katmai NPP region. Economic impact modeling traces the flow of spending associated with tourism activity in a region to identify associated changes in sales, tax revenues, income, and jobs. The principal tools utilized are visitor spending surveys, analysis of secondary data from government economic statistics, economic base models, input–output models, and multipliers (Frechtling 1994). An economic significance analysis estimates the importance or significance of an industry or activity to a region, and usually includes spending by both local residents and visitors from outside the region. The analysis conducted for the Katmai NPP case study is more accurately an economic significance rather than an economic impact analysis because we do not include tax revenues and do not segregate local visitors from those originating outside the region.

An economic 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. Economic impact and significance models are derived with the assistance of modeling software, such as IMPLAN or the Money Generation Model (MGM).[1] MGM, primarily developed by Daniel Stynes at Michigan State University, is used nationwide to model economic impacts of units of the national park system. MGM is an input–output economic model derived from an IMPLAN base model and used to calculate industry multipliers in the local economy. The Katmai NPP economic impact model described here uses the base IMPLAN software directly. We chose this software, rather than the more standardized and user-friendly MGM interface, for its flexibility to adapt to the unique conditions of national park visitation in Alaska.

The economic significance of Katmai NPP visitation was modeled at two geographic scales. First, an overall model was constructed that represented spending and impacts statewide in Alaska resulting from visitors to Katmai NPP. Second, a more localized model was constructed that used the weighted set of expenditures and assessed significance within the five boroughs that encompass Katmai NPP. The local boroughs include the municipality of Anchorage, Bristol Bay, Kodiak Island, Lake and Peninsula, and Kenai Peninsula.[2]

Aggregating expenditure data. The first step in the economic modeling process was to aggregate the spending and visitor estimates into total annual spending profiles. The estimated total number of visitors was divided by the average group size for the corresponding group type and then multiplied by the average per-group-per-trip spending profiles to determine total annual spending. The process was repeated for package day visitors, independent day visitors, and overnight visitors. All three estimates were combined for the aggregated spending estimate used in the economic significance model.

Bridging and margining expenditure data. Following aggregation, the total spending profile was matched to appropriate IMPLAN economic sectors. This two-step process required bridging the spending categories to IMPLAN sectors and then margining the consumer dollar estimates to reflect the producer dollars required for economic impact modeling. The bridging and margining process allocated each of the U of I visitor survey consumer spending categories to IMPLAN economic production sectors. The IMPLAN software constructed the margins from the producer sectors to reflect the local retail economy. Sectors were then reviewed and adjusted where necessary to reflect Alaska rather than national production functions. Each of the 16 IMPLAN sectors that were allocated expenditures during the bridging/margining step is shown in Table 2.[3]

Economic impact modeling. The results of the bridging and margining process were used as input to model the economic significance of Katmai NPP annual visitation activity on the regional and statewide economies. Each of the total annual expenditure amounts listed in Table 2 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 into the model in their original 2006 dollar form. The IMPLAN modeling software adjusted the expenditures to model-year 2007 dollars using sector-specific deflators.

Economic impact estimates. The input–output model produced estimates of industrial output, employment, labor income, and value added using social accounting matrix (SAM)-type multipliers. Values for the two impact models are reported in Table 3. The first and larger of the two sets of estimates is for the impact on the entire state of Alaska resulting from the money spent in-state by visitors to Katmai NPP in one year. The second set used a smaller estimate of expenditures and considered impacts only to the boroughs of Bristol Bay, Kodiak Island, Lake and Peninsula, and Kenai Peninsula, and the municipality of Anchorage, resulting from annual spending by visitors to Katmai NPP.

Table 3 shows Katmai NPP visitor spending of nearly $50 million in Alaska, in 2007. Almost one-quarter of that amount was spent inside Katmai NPP. Katmai visitor expenditures generated $73 million in industrial output, supported 647 jobs (average annual jobs,

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

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

not full-time equivalents), generated $23 million in labor income, and added a total of $37 million to the statewide Alaska economy. The model estimated that Katmai NPP visitors spent $31 million in the five-borough region, with more than a third of that spent inside Katmai NPP. The localized visitor expenditures generated $46 million in total output, supported 390 jobs, generated $15 million in labor income, and added $23 million 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.

Conclusions

MGM modeling informed by U of I visitor surveys is the standard approach to estimating national park economic impacts in the US. The MGM approach uses IMPLAN-generated multipliers along with an estimation model developed specifically to capture national park recreation visitor behavior. The MGM model offers the advantages of free public domain software, a user-friendly interface, and a standardized approach that produces comparable results across national park units. The U of I survey method offers similar advantages of reduced sampling effort (and therefore cost), a novice-friendly predesigned survey instrument, and standardization across national park units. However, this paper presents evidence to argue that the conventional approach has a number of disadvantages when applied in remote places such as Katmai NPP in Alaska.

IMPLAN Model *	Statewide	Five-Borough
Expenditures in Katmai NPP	$12 mil.	$12 mil.
Expenditures outside of Katmai NPP	$38 mil.	$19 mil.
Total Expenditures	$50 mil.	$31 mil.
Total Industrial Output	$73 mil.	$46 mil.
Employment (jobs)	647	390
Labor Income	$23 mil.	$15 mil.
Value Added	$37 mil.	$23 mil.

** Annual Visitation to Katmai NPP, AK; 2007 model year; SAM multipliers*

Table 3. Input–output economic significance model of expenditures in Alaska by visitors to Katmai NPP in 2007, statewide and regional estimates.

Experience from the Katmai NPP case study offers insight for improvement in this type of application. Concerns about the conventional approach to national park economic impact assessment identified in this case study can be categorized into three groups: (1) a survey instrument that is not suitable, (2) a sampling framework that is inadequate, and (3) economic impact assessment computer software that cannot easily be customized to unique local economies.

Visitor survey instrument. The unique qualities of the remote park and the local economy surrounding it contributed to problems with the survey methodology to estimate visitor expenditures. A number of survey design issues likely contributed to faulty Katmai NPP visitation data. First, standardized wording on expenditure questions confused respondents about how to appropriately attribute park-related expenditures to the location where they occurred. Respondents often reported expenditures within the park on goods and services that were more likely purchased outside the park. In fact, because Katmai NPP receives a high percentage of day visits originating far from the local area, related expenditures often occur in the larger economies of Anchorage or other distant locations. The survey failed to instruct respondents on how to appropriately report these distant trip-related expenditures.

The survey's generic directions to respondents also created confusion in reporting travel expenditures and other characteristics unique to Alaska rural tourism. For example, respondents were told to include airfare in "other transportation costs," but failed to specify that local in-state airfare to get to Katmai NPP should be reported separately from airfare spent at the visitor's place of residence to travel to Alaska. Respondents' confusion about the generic survey instructions is further indicated by their reported lengths of stay in the park, the local area, and greater Alaska not corresponding well with their reported expenditures in these locations.

The survey instrument included a map that respondents could refer to when listing expenditure locations. However, the map did not include some of the major trip origin locations such as Kodiak Island or the Kenai Peninsula towns of Homer, Soldotna, and Kenai. The map was primarily designed for the purpose of enabling visitors to identify locations

within the park that they visited. It proved to be poorly suited as a reference for survey takers to identify the location of trip expenditures and activities in the greater national park area. These examples demonstrate the survey's limited ability to attribute expenditure data to appropriate locations—a vital step in accurately determining overall economic impacts.

The economic modeling process was compromised because of the generic U of I visitor survey instrument expenditure categories. The most general of these categories (package tours) accounted for the largest amount of spending recorded under any category. While being very general, these reported package expenditures also appear inflated. This may be because some of the components of packages that were reported as purchased inside the park or inside Alaska were actually consumed somewhere else (this could include both goods and services purchased as part of a tour package). Packages could also have been reported as being purchased in the park or area when they were actually purchased outside of that economic region prior to arrival. In addition to location-attribute concerns, collecting a wide variety of expenditure data within the category of "package" creates problems in economic impact analysis, as this category is too general to allocate expenditures to appropriate sectors of the economy. And, like the portrayal of expenditure locations, industrial sector expenditure allocation is a critical step in accurately determining economic impacts within a region.[4]

Visitor sampling framework. In addition to suggested questionnaire design changes, it is recommended that a revised sampling schedule be employed to better account for the extreme variability in conditions of remote national park environments. Following the U of I visitor survey protocol, a one-week sample of visitor activity is typically collected at most park units nationwide. However, the extreme temporal and spatial variation in visitation patterns found across remote national parks requires a more extensive sampling effort to produce reliable estimates of annual economic activity. This is especially true at Katmai NPP where visitation for bear viewing and sport fishing follows the seasonal movements of bears and availability of fish. In addition, given the predominance of air access to national parks in Alaska, entry points are almost infinite. Because of the reliance on access by air, Alaska weather can interrupt visitation for days or weeks at a time, making a one-week sample unreliable for determining visitor profiles and expenditures. Unlike remote Alaska national parks, other units of the US national park system have well-established time-series data on visitation and visitor profiles that have been developed from ranger patrol reports, entrance kiosk counts, and admission receipts. This type of information is typically used to adjust sparse visitor survey data. However, visitor information from these types of secondary sources is rarely collected in Alaska's remote national parks.

Accurate and complete survey data are difficult to collect in any study. The use of three sampling periods, though intended to obtain a more representative sample of the population than the usual one-week sampling effort, was still limited in several ways by the logistics of working in this remote, northern, and mountainous setting. Therefore, while the 2006 U of I visitor survey obtained the best available data for understanding characteristics of current visitors to Katmai NPP, its representativeness of the population of Katmai NPP visitors is limited both temporally and spatially. To determine whether our concerns related to MGM economic impact modeling and the U of I visitor 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 visitor survey and its applicability to MGM or IMPLAN economic impact modeling. We found that the survey sample produced significantly different estimates of visitor characteristics than those derived from other existing sources of data on Denali NPP visitors (Brigham, Fay, and Sharfarz 2006; Brigham et al. 2009).

Because of the variability in visitation patterns and the lack of secondary data about visitor population parameters, we recommend that the standard one-week sampling schedule be significantly increased in future visitor studies in Alaska's national parks. Nonetheless, the use of three sampling periods in the U of I visitor survey of Katmai NPP was still limited in several ways by the logistics of working in this remote, northern, and mountainous setting. We conclude that the modified sampling schedule of three weeks was still inadequate to accurately assess the park's visitation characteristics.

Customized economic impact assessment. The research presented in this paper used a custom national park economic impact model that derived estimates directly from IMPLAN software rather than through the standard MGM-assisted process. While this more direct method has the disadvantages of increased software cost and a more complex analysis process, we feel that these tradeoffs are worthwhile to more accurately account for the unique Alaska remote rural economy.

A modified approach. The authors identified a number of insights in this case study application that center on adapting the survey data and impact model to the unique situation found in isolated economies. The measure of "visitor-nights"—defined as "nights spent in the local area" in the MGM modeling software interface—was a problem for the Katmai NPP model. Visitors to this 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 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 case study used 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. Working directly within IMPLAN allowed the authors to easily adjust the data to units that made sense for that park, rather than forcing the data into the MGM standard visitor-night units that fit poorly with the actual situation.

The U of I visitor survey included spending categories of "package," "guide services," and "donations" that are not usually measured on standard national park U of I 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 more easily bridged and margined to economic sectors with the IMPLAN software. It is recommended that attempts be made to further refine the national park visitor survey process to better account for the unique rural economies of Alaska. In this effort, it may be necessary to adapt the visitor survey spending categories, as well as the bridging and margining methods used in modeling. We believe that unless this type of custom modeling is available to users of MGM software, it would be advantageous to continue to develop the IMPLAN modeling approach for the relatively isolated national parks in Alaska.

In an attempt to develop workaround solutions to pervasive economic impact assessment weaknesses for rural public lands in Alaska, we have identified the types of existing problems and have presented our case study in sufficient detail so as to allow others to follow our approach. As the results presented in Table 3 demonstrate, these are not trivial concerns. A number of assumptions are necessary to wade through the inadequacies of currently available national park visitor behavior data in Alaska. As the table shows, utilizing the current data to their full extent produces estimates of economic impacts much larger than estimates derived from a more conservative set of assumptions about unknown parameters. The estimated total number of jobs supported by Katmai NPP visitors, for example, is 65% higher under the more liberal set of assumptions presented in Table 3. Unfortunately, both of these estimates are well within a statistical margin of error, given the uncertainties surrounding the model parameters. The only real long-term solution is to improve the rigor of the science behind the models.

Endnotes

1. Information about IMPLAN software, terminology, and applications is at http://implan.com/. The MGM website is http://web4.msue.msu.edu/mgm2/default.htm.
2. The municipality of Anchorage functions similarly to a borough, which are similar to counties in other states.
3. Detailed documentation of the bridging and margining can be found in the full report of the economic significance of visitation to Katmai NPP located on the website of the Institute of Social and Economic Research, University of Alaska–Anchorage: http://iser.uaa.alaska.edu.
4. The authors' specific recommendations for questionnaire revisions can be found at http://iser.uaa.alaska.edu/tmp/KatmaiAlaska-ginny.pdf.

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