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The economics of roadside bear viewing

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ABSTRACT

Viewing bears along roadside habitats is a popular recreational activity in certain national parks throughout the United States. However, safely managing visitors during traffic jams that result from this activity often requires the use of limited park resources. Using unique visitor survey data, this study quantifies economic values associated with roadside bear viewing in Yellowstone National Park, monetary values that could be used to determine whether this continued use of park resources is warranted on economic grounds. Based on visitor expenditure data and results of a contingent visitation question, it is estimated that summer Park visitation would decrease if bears were no longer allowed to stay along roadside habitats, resulting in a loss of 155 jobs in the local economy. Results from a nonmarket valuation survey question indicate that on average, visitors to Yellowstone National Park are willing to pay around $41 more in Park entrance fees to ensure that bears are allowed to remain along roads within the Park. Generalizing this value to the relevant population of visitors indicates that the economic benefits of allowing this wildlife viewing opportunity to continue could outweigh the costs of using additional resources to effectively manage these traffic jams.

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1. Introduction

With a healthy population of black and grizzly bears, Yellowstone National Park has long been a popular destination for visitors seeking abundant and unique wildlife viewing opportunities. Observing bears while driving on the Park's 300 miles of paved roads provides a rare opportunity for visitors to get a close look at these charismatic megafauna without ever having to leave the roadside, but facilitating safe roadside bear viewing has required an evolution in bear management practices throughout the Park's history. Traffic jams on the Park's roads due to bear viewing began in the early 20th century, a time when visitors could feed panhandling bears from stagecoaches with some regularity (Schullery, 1992). Practices such as these led to an increase in the number of bear-inflicted human injuries within the Park's boundaries, averaging 48 injuries per year from the 1930's through the 1960's (Gunther and Hoekstra, 1998). With the implementation of a strictly enforced bear management program in the 1970's, this number declined dramatically, with a large portion of the decline coming from reduced black bear caused injuries on roadsides (Gunther, 1994).

Today, rather than capturing and relocating or hazing bears that forage in roadside meadows, Park management focuses on managing visitors viewing roadside bears, in an effort to promote education and appreciation for the Park's resident wildlife, as well as to allow the bears to continue using roadside habitat (Gunther and Wyman, 2008). This approach has been largely successful; while traffic jams on the Park's roads due to drivers stopping to view bears, referred to as "bear jams," have been on the rise, there have been no associated bear-inflicted human injuries (Gunther and Wyman, 2008). Nonetheless, allowing bears to use roadside habitat does not come without a price. The number of bear jams, as well as the total Park staff time required to manage bear jams, has grown exponentially over the years (Gunther and Wyman, 2008). In 2011, the year with the most recorded bear jams, Park staff spent 2542 personnel hours managing visitors at 1031 bear jams, providing traffic control and monitoring of visitor behavior to ensure safe viewing opportunities. On some days, there are such a large number of bear jams occurring simultaneously that there is not enough Park staff to respond to them all, leaving Park visitors

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interacting with grizzly and black bears unattended (Gunther and Wyman, 2008).

Visitation to Yellowstone National Park is on the rise, with annual visitation from 2009 to 2013 ranking among the highest visitation years on record. Correspondingly, the number of bear jams that occur each year will likely continue to trend upward. When evaluating future management decisions involving bear viewing and the amount of limited Park resources to allocate towards the management of bear jams, the economic values associated with the recreational activity of roadside bear viewing can provide one important piece of information to guide decision-making. For instance, if the economic benefits of retaining the option for visitors to view bears along roadsides within Yellowstone is greater than the personnel costs necessary to provide this viewing opportunity in a safe manner, this management decision is justified on economic grounds.

Two types of economic analyses that can help inform tradeoffs in the use of scarce public resources are regional economic impact analysis and benefit-cost analysis. Regional economic impact analysis, often required under federal regulations and regularly included in National Park Service planning, can be used to capture the income and employment generated in the local economy due to visitation to public lands. These impacts result from the amount of money non-local visitors spend in the local economy on their trips, which provides a measure of the significance of a regional resource such as Yellowstone (Duffield et al., 2006). For instance, in 2012, non-local visitors to Yellowstone National Park spent over $398 million, supporting 5,594 jobs in the local economy and generating more than $164 million in labor income (Cullinane Thomas et al., 2014). Impact analysis differs greatly from benefit-cost analysis, which takes a national perspective and compares the social benefits and costs of a given action to help inform social decision-making. This is the recommended technique for formal economic analyses of government programs or projects (OMB Circular A-94) and can be used to determine whether a management action promotes an efficient use of society's scarce resources. In the case of resource uses which do not have a market price that reflects their value to society, such as recreational wildlife viewing opportunities, economic benefits can be estimated through nonmarket valuation methods. These methods capture the public's willingness-to-pay, the same measure used to establish market clearing prices in competitive markets for private goods. Willingness-to-pay in excess of current costs, i.e. consumer surplus, is the accepted benefit measure used in benefit-cost analyses performed by federal agencies.

For the first time, this study will quantify various components of economic value associated with roadside bear viewing in Yellowstone National Park, utilizing primary data collected in 2009 through a survey of Park visitors. First, background on the methodologies used, relevant literature, and data collection methods is presented. Next, demographics and statistics associated with bear viewing are summarized. The economic impacts of a hypothetical management decision to no longer allow bears to stay along roadside habitats are then presented, based on actual non-local visitor spending from a sample of survey respondents. In addition, some of the economic benefits associated with roadside bear viewing in Yellowstone National Park are monetized using results from a nonmarket valuation willingness-to-pay survey question. Finally, implications for Park management are discussed.

2. Methodology and literature

2.1. Regional economic impact analysis

Economic impact analysis can be used to estimate employment and income effects on a local economy due to market transactions associated with a particular resource use, such as visitation to Yellowstone National Park. The flow of non-local visitor expenditures can be tracked as it moves throughout various sectors of a particular regional economy, which is typically comprised of a county or set of counties directly affected by this spending. Because economic activity in one sector spurs economic activity in other sectors, economic input–output models are frequently used to determine how these sectors will be affected by changes in spending. Three categories of effects are captured through input–output models; direct, indirect and induced effects. Indirect and induced effects are referred to as secondary effects of visitor spending, and the sum of direct and secondary effects capture the total impacts of visitor spending.

Input-output models can provide important information regarding the economic impacts of a particular management decision. However, they are based on several simplifying assumptions, all of which can affect the accuracy of the resulting estimates. For instance, the regional economy being modeled is assumed to have no supply-side constraints. That is, a firm or industry can produce additional output to meet increased demand without taking resources away from other activities, when in reality they may be constrained by the availability of land, labor, or capital. These models also make the simplifying assumption that displaced labor in the regional economy will not be hired in another sector in that economy. Further, it should be noted that these models capture economic impacts at a specific point in time, assuming no further adjustments are made in response to the management action.

While there can be significant limitations to the use of input–output models, they can provide useful approximations of the economic impacts of a management decision. They are frequently used to inform land management planning, and have been used to demonstrate the economic impacts associated with wildlife viewing opportunities specifically. For instance, the U.S. Fish and Wildlife Service periodically releases a report entitled Banking on Nature: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation, which estimates the economic impacts associated with recreational use on refuge lands. The latest report reveals that in fiscal year 2011, spending by all wildlife refuge visitors supported more than 35,000 jobs and generated nearly $793 million in employment income. About 72% of total expenditures were generated by non-consumptive refuge activities, such as wildlife observation (Carver and Caudill, 2013). It should be noted that these estimates focus solely on the economic impacts associated with refuge lands. They do not reveal any information regarding the economic impacts of alternative uses of the land and therefore, do not provide insight into the use of the land that would provide the most jobs.

Shifting to the region of focus for this study, Loomis and Caughlan (2004a) conducted a survey of visitors participating in the National Elk Refuge winter elk viewing sleigh ride in the Jackson Hole area in 2002. They estimated the job and income impacts resulting from spending by current visitors, as well as changes in impacts associated with various management alternatives on the Refuge. The authors found that current non-local sleigh ride visitation generated around 49 jobs and $1 million in labor income in the local economy and current nonresident visitation generated around 55 jobs and $956,832 in labor income in the larger regional economy. Again, these estimates do not provide any information as to the impacts that would be generated given alternative uses of the land. Turning to wildlife observation in Yellowstone National Park specifically, a series of visitor and household surveys focused on various components of economic value associated with recovered wolf populations and wolf viewing opportunities have been administered since the early 1990's. The latest visitor survey indicated that roughly 325,000 visitors saw wolves within the Park in