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Recreation Benefits of U.S. Parks

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Abstract

Over 90 percent of people living in the United States participate in some type of outdoor recreation, from walking the dog to rock climbing. These activities increase a person's well-being and are examples of recreation benefits. These benefits can be measured by using a variety of available techniques to calculate consumer surplus values.

Consumer surplus values for recreation in U.S. parks were collated from an extensive literature review. Studies conducted between 1967 and 2003 yielded over 1,200 observations of non-market benefits. From this meta-analysis, it was determined that an average day of recreation in U.S. parks provide people with a non-market benefit of \$60.50/day (2006 US\$). With an estimated 924 million visitor days, the benefit of outdoor recreation on federal park lands during 2006 was estimated at \$54.7 billion dollars. This analysis did not include state, county, and city parks, and hence the total benefit of outdoor recreation in all U.S. parks would be significantly higher.

Keywords

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consumer surplus
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INTRODUCTION

The term *park* is used here to mean a piece of public land maintained in a natural state. This is a generic term, but parks are not generic places. Parks vary widely in size, features, and management style. Size can range from a few feet to millions of acres. Yellowstone National Park, for example, covers 2.2 million acres and extends into three states (Wyoming, Montana, and Idaho). Tongass National Forest in Alaska covers 17 million acres. City parks, on the other hand, are typically less than 50 acres, the smallest being Mills End in Oregon at only two feet across. Features at parks also vary widely. People might visit Yellowstone National Park to see Old Faithful, a geyser that erupts with regularity and to view wildlife such as bison, elk and wolves. Other parks are limited to a picnic table and a small grassy area. In addition to size and feature variation, management style variation also ranges broadly, from national parks where commercial logging is not permitted to Bureau of Land Management areas that allow mineral exploration.

No matter what size, features, or management styles, most parks offer the visitor a chance to participate in an outdoor recreation activity. In many of the smaller parks, people participate in relaxing, picnicking and dog walking. At the larger parks, other activities come into play such as boating, backpacking and rock climbing. Participating in recreation activities provides the visitor with an increase in their well-being. An increase in well-being is a non-market benefit that could come in the form of an increase in health and fitness levels or a lowered stress level.

Over 90% of people living in the U.S. participate in some form of outdoor recreation, with traditional park activities still among the most popular (walking, family gatherings, picnicking, and wildlife viewing). The fastest growing include birdwatching, backpacking, off-road vehicle driving, camping, and skiing (U.S. Army Corps of Engineers, 1990; USFS, 1996; FWS, 2003; Stynes-NPS, 2006; BLM, 2007). Since many people do not pay a fee to participate in these activities, a way to calculate non-market benefits was needed.

Methods for calculating non-market benefits of recreation in U.S. Parks have evolved over the last sixty years (Clark 1915a, Clark 1915b, Trice and Wood 1958, Pearce and Turner 1990, Freeman 2003, Champ et al. 2003, Carson 2000). One common way to measure the benefit is to calculate the consumer surplus value. Consumer surplus values are the residual benefits people experience over and above any amount paid to participate in the activity. As can be expected, most of the time people do not pay anything to participate in a recreation activity on public land.

Consumer surplus benefits can be determined using non-market valuation techniques. Two widely used and accepted techniques are the contingent valuation method and the travel cost method (Pearce and Turner 1990, Freeman 2003, Champ et al. 2003, Carson 2000). The contingent valuation method is based on the stated preference of a respondent when presented with a hypothetical situation (Pearce and Turner 1990, Freeman 2003, Champ et al. 2003, Carson 2000). For example, a park might want to know if a person would pay to climb at an area where they currently do not pay. This fee they are asked to pay would go directly to hiring a full time park ranger to assist with climbing accidents.

Alternatively, the travel cost method is a revealed-preference method in which a person is asked to supply information about costs they incur on a trip. Using the climbing example again, visitors might be asked to report fuel costs and campsite fees they paid for the purpose of climbing at this site. Non-market benefits of environmental amenities are then estimated using the cost of travel as a reflection of value to the person. This method is based on the assumption that to obtain non-market goods, consumers must incur costs (Pearce and Turner 1990, Freeman 2003, Champ et al. 2003, Carson 2000).

Consumer surplus non-market benefits have been calculated for outdoor recreation activities since the 1960's. Various people, including the author, have collated these benefit values into a central database for outdoor recreation. The purpose of this study was to determine benefit values for recreation in U.S. parks based on this national dataset.

DATA COLLECTION

Data were collected from journals, extension bulletins, books, reports, and directly from authors over a period of twenty years.¹ Variables collected include consumer surplus non-market recreation benefits, type of recreational activity, location, survey method used, and the year data was collected. A database was created to store this information, providing a flexible platform for subsequent analysis. For a full list of variables collected or to get a copy of the database for a benefit transfer study, please contact the author or refer to Kaval and Loomis, 2003 (available online).

The resulting data set includes 1229 observations and spans 36 years (1968-2003), twenty-five types of activities, and 106 locations. All non-market benefit data were converted to 2006 U.S. dollars per person per day for comparison purposes. It is believed that this collection of data encompasses most of the outdoor recreation benefit studies conducted to date for U.S. parks.

Recreational activities in the studies took place primarily in national parks, national forests, state parks and state forests. However, many studies did not specify a park type or included several park types such as city and regional parks. These studies were simply categorized as "not specified."

For location comparisons, studies were grouped into six regions: North-East, South-East, Intermountain, Pacific Coast, Alaska, and a category called 'Multiple Area' studies in which a study was conducted in several regions. Regions correlate with U.S. Forest Service Area Designations (USFS, 2006) and a breakdown by state is given in Table 1.

¹ Data collection began in 1983 with Cindy Sorg and John Loomis. There were four subsequent significant additions to the dataset following this initial research: 1988 (Richard Walsh, Donna Johnson, and John McKean), 1993 (Doug MacNair), 2001 (Randall Rosenberger and Ram Shrestha), and in 2003 (Pamela Kaval) (Kaval and Loomis, 2003; MacNair, 1993; Rosenberger and Loomis, 2000; Shrestha and Loomis, 2003; Sorg and Loomis, 1984; Walsh et al., 1992).

Table 1. Non-market benefit studies were divided into five geographical regions, with component states listed. Studies that covered more than one region were assigned to a sixth category termed ‘Multiple Area Studies’.

North-East Region	South-East Region	Intermountain Region	Pacific Coast Region	Alaska Region
Minnesota	Texas	Montana	Washington	Alaska
Iowa	Oklahoma	North Dakota	Oregon	
Missouri	Arkansas	Wyoming	California	
Wisconsin	Louisiana	South Dakota	Hawaii	
Illinois	Mississippi	Nebraska		
Michigan	Tennessee	Colorado		
Indiana	Kentucky	Kansas		
Ohio	Virginia	Arizona		
West Virginia	North Carolina	New Mexico		
Pennsylvania	South Carolina	Idaho		
New York	Georgia	Utah		
Vermont	Florida	Nevada		
New Hampshire	Alabama			
Maine				
Massachusetts				
Rhode Island				
Connecticut				
New Jersey				
Delaware				
Maryland				
Washington DC				

A visitor recreation day is defined here as a 12-hour visit to a park. If one person went to Yellowstone and hiked for 12 hours, this would be considered one visitor recreation day. But if three people went to Yellowstone and one hiked, one canoed, and one swam, each for 4 hours, this would also be one visitor recreation day. This unit of recreation is important for measuring the non-market benefits of outdoor recreation.

RESULTS: NON-MARKET BENEFITS OF RECREATION

In 1990, the U.S. Army Corps of Engineers reported 402 million visitor recreation days on federal lands. Federal lands included land within the jurisdiction of the U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service, and National Park Service. It did not include state parks, county parks, or city parks. More recent reports (1996-2006) have also estimated the number of visitor recreation days for individual categories of federal lands (Table 2). If it is assumed that visitation rates increased linearly over time, then a total number of recreation days can be estimated for federal lands in 2006 (Table 2). Using these calculations, it is found that visitor recreation days increased from 402 million in 1990 to 924 million in 2006.

Table 2: Numbers of Visitor Recreation Days on Federal Lands in Millions.

Interpolated data are given based on the original survey data in bold.

<u>Agency</u>	<u>Year</u>				
	<u>1990</u>	<u>1996</u>	<u>2003</u>	<u>2005</u>	<u>2006</u>
Bureau of Land Management (BLM)	38	49	62	68	70
U.S. Forest Service (USFS)	242	341	457	506	523
National Park Service (NPS)	115	174	243	273	283
U.S. Fish and Wildlife Service (USFWS)	7	22	39	46	49
Total Federal	402	586	801	894	924

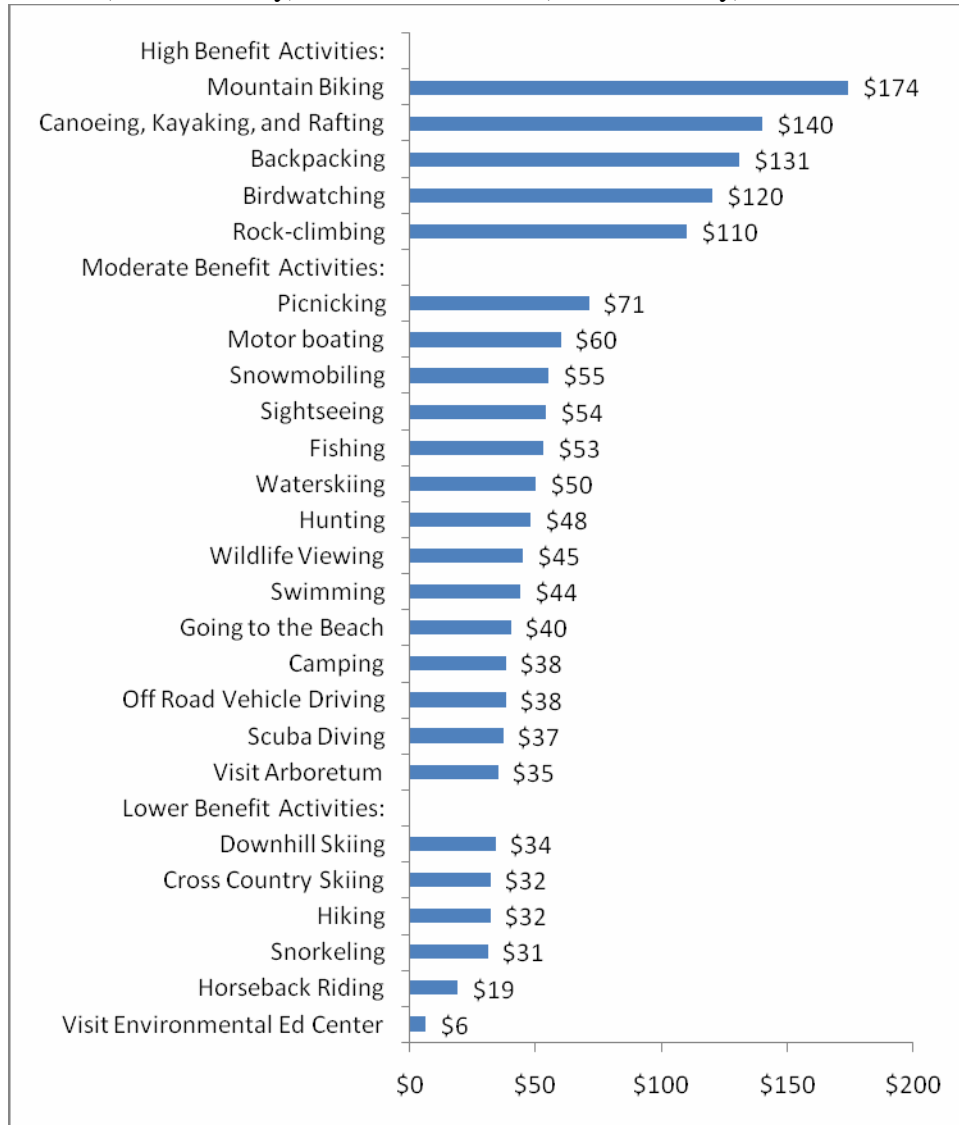
*Note: A visitor recreation day is calculated as recreating on a public land for a 12 hour period.

(U.S. Army Corps of Engineers 1990, USFS 1996, USFWS 2003, Stynes-NPS 2006, BLM 2007)

Of the 1,229 observations collected in the recreation benefit database, the average non-market benefit of recreation was found to be \$60.50/person/day in 2006 US\$. Multiplying this value by the number of visitor days produces a net benefit from recreation in federal parks of approximately \$54,692,000,000 (2006 US\$).

This \$54.7 billion represents an average benefit across a range of activities and locations. Our understanding of these non-market recreation benefits can be increased by comparing different activities and park types. Of the twenty-five different activities assessed, benefits ranged considerably, from \$6 to \$174/person/day (2006 US\$). With such wide ranging benefits, the activities were divided into three groups – high value (>\$100/person/day), moderate value (\$35 to \$100/person/day) and low value (< \$35/person/day). High value recreation activities include mountain biking, canoeing, kayaking, and rafting, backpacking, birdwatching, and rockclimbing. Visiting environmental education centers produced the lowest value, with most other activities exceeding \$20/person/day. Overall, it is seen that benefits of recreational activities in parks differ significantly by the activity type. However, all activities that were studied realized a positive benefit (Figure 1).

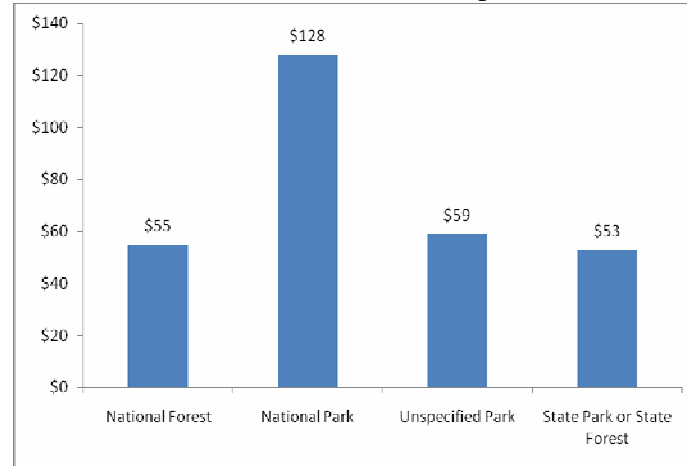
Figure 1. Average Non-Market Recreation Benefit/Person/Day by Activity
 (2006 U.S. Consumer Surplus) separated by high benefit (over \$100/day), moderate benefit (\$35-\$100/day) and lower benefit (under \$35/day) activities.



Benefits were then analyzed by park type. Park types include national parks, national forests, state parks and state forests, and those studies that either included multiple park types or did not specify. Results were similar for national forests (\$55/person/day), state parks and state forests (\$53/person/day) and those areas that were not specified (\$59/person/day) (Figure 2). National parks stand out, however, with a recreation benefit at least twice as high as the other areas (\$128/person/day).

In most instances, people have to pay to enter a national park, while most access is free to a national forest, state park, state forest, county park or city park. There are many likely reasons for the higher recreation benefit in national parks; perhaps perceived value is in part a direct consequence of having to pay to enter the park.

**Figure 2. Average Non-Market Recreation Benefit/Person/Day by Park Type
(2006 U.S. Consumer Surplus \$)**



DISCUSSION AND CONCLUSIONS

The purpose of this study was to determine the recreation benefits of U.S. Parks. To accomplish this goal, available literature from 1967 through 2003 was collated and analyzed. Results show that a person experiences a non-market benefit of \$60.50 for each twelve hour recreation day at a U.S. park (2006 US\$). With an estimated 924 million visitor recreation days at U.S. federal parks in 2006, this yields an overall non-market benefit of \$54.7 billion (2006 US\$).

A positive benefit was realized for all outdoor recreation categories, with birdwatching and mountain biking among the most highly valued. It is encouraging that birdwatching has a high value, because it is an activity that people of all ages and abilities can participate in. It can be accomplished while walking on a trail or driving around in a tour bus. Mountain biking, on the other hand, is not for everyone. Mountain bikers favor certain trails such as the Slickrock Trail in Moab, Utah. The long distance traveled to reach these trails produces a high perceived value. Interestingly, activities such as visiting environmental education centers are not as highly valued. Regardless, overall consumer surplus non-market benefits show all outdoor activities to have a positive consumer surplus value.

Comparing data by park type revealed that activities in national parks yielded twice the benefit, on average, compared to activities in other park types. This may reflect a perception that national park designation is correlated with a higher quality than an area that is not (Weiler and Seidl, 2004; Vaske et al., 1980) or simply that paying a dollar fee gives a sense of greater value. Non-market benefits could also be related to sightings of rare or endangered species. National parks are havens for endangered species, especially those that are unwanted outside of the park. Some ranchers believe that bison will transmit the disease brucellosis to their cattle herds, if allowed to establish outside Yellowstone National Park, and wolves are perceived as a direct threat to cattle and sheep. The experience of recreational activities, such as cross-country skiing or canoeing, is more memorable when endangered wildlife such as grizzly bears or wolves are seen or heard.

The combined studies show a significant positive non-market benefit of outdoor recreational activities in U.S. parks in excess of \$54.7 billion annually. People may not be paying directly to participate in these recreational activities, but still enjoy a substantial benefit in terms of well-being. In this way, providing access to public parks increases the welfare of United States citizens, in turn yielding an increase in the welfare of the country. These results demonstrate the tremendous value of parks in the United States and the benefits of managing them for outdoor recreation.

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