

For the Benefit and Enjoyment of the People: An Exploration of the Economic Benefits of National Parks

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THE INSCRIPTION ON THE ROOSEVELT ARCH, “For the Benefit and Enjoyment of the People,” has welcomed visitors to Yellowstone National Park since 1903. Today it reminds us of the significant benefits that the American public receives from our national parks. These benefits may be personal (e.g., education, health), social (e.g., community identity, cultural resource protection), environmental (e.g., biodiversity protection), or economic. While all these provide valuable insights into the relationships between parks and people, the economic benefits may be the least understood.

Many benefits of national parks can be expressed in monetary values. Local communities benefit from job creation and business sales supported by park tourism. Park visitors benefit from the recreation and leisure opportunities in national parks. Outstanding features of many parks are shown virtually through webcams, allowing people to experience these from their own homes. Many people value the mere existence of national parks and their preservation for future generations. Significant methodological advancements in environmental and natural resource economics have resulted in the ability to determine the monetary value that the public assigns to these varied uses.

Of course, national parks can be a source of costs as well. These include operations and maintenance costs, and can include land acquisition costs and possible losses of local property tax revenue. A full accounting of both economic benefits and costs (i.e., net benefits) is most relevant to policy and management decisions. However, the costs associated with establishing and maintaining parks are better understood and often more straightforward to quantify than the benefits. Thus, the focus of this article is on the latter.

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Recognition that national parks provide significant economic benefits to the American public is certainly not a new concept. In the late 1940s, the associate director of the National Park Service (NPS), A.E. Demaray, wrote to leading economists and analysts throughout the country. He explained the agency's interest in conducting a comprehensive economic study of the national park system and solicited their advice as to whether such an effort was worthwhile. Demaray explained that "it is believed ... that there are secondary or indirect economic benefits derived from these areas which are in excess of the economic returns and benefits that would accrue if the areas were used for other purposes" (NPS 1949: 2).

NPS economist Roy Prewitt reviewed the responses to the letter, consulted with other federal agencies, and presented a synthesis of what was then the state of the science. His report recognized the full range of economic benefits supported by national parks, but concluded that research methods were not yet sufficiently developed to estimate all relevant values (NPS 1949). Nevertheless, Prewitt's report did include a prescient discussion that led to the development of such methods, which are in common use today. Almost seven decades later, many of these values have been estimated to yield a comprehensive picture of the economic benefits of national parks.

This comprehensive picture is critically important to NPS. It positions the agency to better advocate for its mission by engaging audiences that are conversant with the economic justification of government programs. Further, these economic benefits demonstrate that national parks and NPS programs *create* significant value for the American public. They also demonstrate that the value placed by the American public on NPS's role to conserve park resources "unimpaired for future generations" is on a par with the value of on-site visitor use. In other words, economics has demonstrated a significant public demand for both prongs of the NPS mission as laid out in the 1916 Organic Act (see Neher et al. 2013; Haeefe et al. 2016a, 2016b).

The research methods used to estimate these benefits do not quantify or describe all relevant values of national parks. In addition to economics, other valuation systems include deep ecology and environmental ethics. What distinguishes economics is that it quantifies only those values for which people are willing to make tradeoffs, such as which parks to visit and how often. However, some values—those associated with nature, culture, sustainability, etc.—may not be amenable to economic valuation since they commonly do not involve willing tradeoffs. Therefore, economics does not displace other valuation systems, but instead offers an additional way to talk about national park benefits that is complementary to other means.

The economic benefits of national parks

Two broad categories capture the economic benefits of national parks: contributions to the economy and net economic values (Figure 1). Another characterization involves what are known as ecosystem services. These are the benefits that people derive from properly functioning ecosystems, such as water purification, flood regulation, and scenic views. These benefits are clearly relevant to national parks and surrounding communities and are captured by the categories described here.

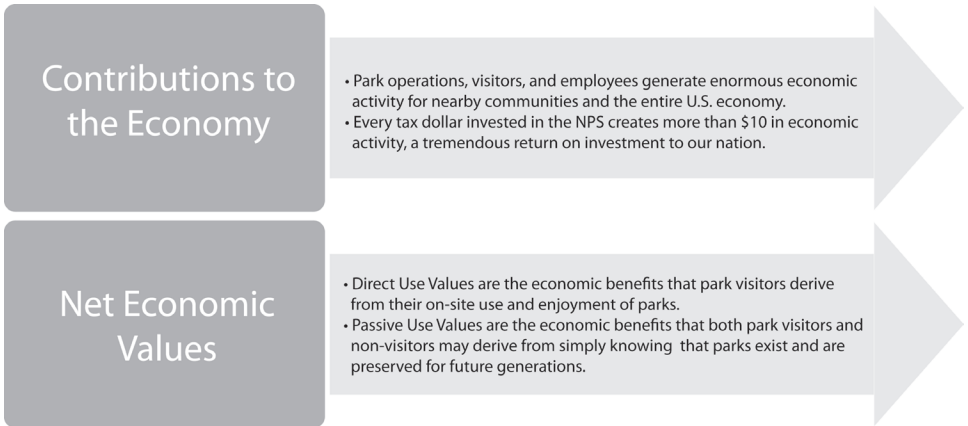


Figure 1. The economic benefits of national parks.

Contributions to the economy are the jobs, sales, tax revenues, and other positive economic activity generated by national park visitation and operations in local, state, and national economies. National parks contribute to economic growth and jobs across the nation through:

- Spending by NPS visitors in communities near parks;
- Local purchases of supplies and services for park operations;
- Employee payroll spending in nearby communities;
- Grants and payments to communities from NPS programs; and
- Restoration and construction activity from NPS infrastructure repair investments.

This category of economic benefits has traditionally been reported for visitor spending on an annual systemwide basis by NPS, originally as the Money Generation Model and now as Visitor Spending Effects (VSE; Cullinane-Thomas and Koontz 2017). The VSE model utilizes three key data inputs: (1) park-level annual visitation estimates compiled by the NPS Visitor Use Statistics Office; (2) profiles of visitor spending patterns in local gateway regions derived from survey data collected through the NPS Visitor Services Project (VSP); and (3) regional economic multipliers derived from the IMPLAN software (IMPLAN Group LLC) that describe the economic effects of visitor spending in local economies. Between 2003 and 2017, a total of 57 park surveys included the visitor spending questions necessary for VSE analysis. Data from these 57 studies were used to develop spending patterns for the surveyed parks. Non-surveyed parks were analyzed by classifying them into four types: parks that have both camping and lodging available within the park; parks that have only camping within the park; parks with no overnight stays; and parks with high day use. Generic spending profiles were developed for each of these park types. These profiles should be reasonably accurate for

many park units. However, a number of parks are not well represented by the generic profiles. For these parks, profiles were constructed using the best available data.

Results from the VSE reports are available online via an interactive tool at <https://www.nps.gov/subjects/socialscience/vse.htm>. Users can view year-by-year trend data and explore current-year visitor spending, jobs, labor income, value added, and economic output effects by sector for national, state, and local economies. Pilot studies are underway for expanded contributions analyses of park operational activities, including purchases of supplies and services from local businesses.

The second broad category, *net economic values*, describes the economic benefits of national parks that are received by individual people. Whether a good or service is traded in a market or not, economists measure how much that good or service is worth to an individual based on what they are willing to give up to get it. In monetary terms, this is measured by an individual's willingness-to-pay. *Net economic value*, also called consumer surplus, describes the economic benefit that consumers get when they can obtain a good or service for less than they are willing to pay for it. In competitive markets, prices provide a measure of marginal willingness-to-pay. Although the marketplace fails to adequately provide for public resources such as national parks, the absence of a market price does not indicate an absence of economic value.

Nonmarket valuation measures the net economic values people assign to goods and services that are not traded in markets, such as many of those supported by national parks.

Where competitive markets do not exist, economists employ nonmarket valuation approaches to measure these net economic values. Such values help explain behavior such as visitation. For instance, the economics literature shows that people generally participate in those activities that give them the highest net economic values. Therefore, these values can help us understand how people choose between activities, such as the decision to go on a snowmobile tour or a cross-country ski trek.

Consideration of such preferences can inform a variety of resource allocation decisions in national parks. For instance, the cost of a management action can be compared with the net economic values it provides to determine whether that action is justified on economic efficiency grounds. In addition, tradeoffs associated with competing park uses can be informed by evaluating the net economic values generated by each. At Cape Hatteras National Seashore, for example, the use of off-road vehicles (ORVs) must be balanced with the protection of important habitat for threatened and endangered species. Dundas et al. (2018) use a net economic value framework to evaluate the benefits and costs associated with the park's ORV management plan. The authors compare the expected loss in recreational fishing values—as well as losses in other ORV recreation values, increased congestion costs, and enforcement costs—to the potential gain in benefits associated with protecting coastal biodiversity. Results reveal relatively modest economic costs and a positive benefit–cost ratio, thus providing general support for the plan.

Within the broad category of net economic values are two subcategories that are particularly relevant to the NPS. First, *direct use values* are the economic benefits that people receive

from on-site use and enjoyment. Visitors receive these benefits while participating in activities such as sightseeing, hiking, and interpretive programs. When NPS first considered how to measure these values in the 1940s, of the leading economists that responded to Demaray's letter, only one discussed the possibility of doing so. Harold Hotelling, now widely recognized as a pioneer in the field of economics, thought it was indeed possible to quantify the direct use values supported by national parks. Building on the work of French engineer and economist Jules Dupuit, Hotelling discussed an approach in which visitor travel costs could be used to derive a demand curve and measure of consumer surplus for the service of a park. In his one-and-a-half-page response, Hotelling outlined the basic notion of the travel cost method, a revealed preference approach to nonmarket valuation that was further developed in the late 1950s and 1960s. At the time, however, Hotelling's suggestions were somewhat vague and largely ignored by NPS.

The National Park Service and US Fish and Wildlife Service actually had been tasked with estimating recreation values for the US Bureau of Reclamation in the 1940s, but struggled to find a satisfactory approach. Following World War II, visitation to national parks and other public lands skyrocketed, and the question of how to adequately measure recreation benefits became increasingly important for the management of federal lands. By 1962, Congress required that recreation be considered in benefit-cost analyses for water projects (Banzhaf 2010). Significant developments in nonmarket valuation continued throughout the 1960s as the concept of consumer surplus became established as the relevant measure of economic benefits. Today, the travel cost method is used extensively to value recreation opportunities on public lands. Examples of applications to national parks include the following (values have been inflated to 2017 dollars):

- Melstrom (2014) estimated the per person value of a visit to Stones River, Monocacy, and Fort Donelson national battlefields at around \$34, \$10, and \$11, respectively.
- The direct use value of a visit to Great Sand Dunes National Park & Preserve has been estimated at \$74 per person per day (Heberling and Templeton 2009).
- The value of a visit to Yellowstone National Park has been estimated at \$59 per person per day (Benson et al. 2013).
- A day of bear viewing at Katmai National Park and Preserve has been found to have a direct use value of \$301 per person (Richardson et al. 2017).

Yet what if a person doesn't visit a national park but still assigns a value to its existence or preservation for future generations? This is described by the second subcategory of net economic value, *passive use values*, which are the economic benefits individuals derive from national parks independent of on-site use and enjoyment. For example, an individual may never visit Glacier National Park, but would still be willing to pay money to ensure that the park's resources are protected for future generations. These benefits were formally recognized by economist John Krutilla in his seminal 1967 paper "Conservation Reconsidered." "When the existence of a grand scenic wonder or a unique and fragile ecosystem is involved, its preservation and continued availability are a significant part of the real income of many

individuals” (Krutilla 1967: 779). Krutilla made the compelling argument that accounting for only direct use values would underestimate the economic value of a place such as the Grand Canyon, and if there was a question regarding preservation, this could lead to a decision to not preserve the canyon (Boyle and Markowski 2003).

Passive use values play a clear role in conservation decisions surrounding national parks. Yet even with the recognition of these values, their estimation initially proved difficult. Unlike direct uses such as recreation, no observed behavior can be used to infer a measure of value. As a result, stated preference methods, such as contingent valuation, developed over time as a means to measure passive use values. These methods draw inferences about values from carefully designed scenarios of tradeoffs that people are asked to evaluate in survey settings (Flores 2017). For instance, individuals could be asked how they would respond when faced with a decision that involves trading off some of their income in order to maintain the quality of a park’s resources.

The importance of estimating passive use values came to the forefront as a result of the 1989 *Exxon Valdez* oil spill in Prince William Sound, Alaska. The following year, the Oil Pollution Act (OPA) was enacted, giving agencies such as NPS the authority to address the impacts of oil spills on natural resources. Part of this process involves determining the amount of monetary compensation, or “damages,” required to make the public whole for injuries to natural resources, highlighting a clear role for nonmarket valuation. The National Oceanic and Atmospheric Administration (NOAA) promulgated implementing regulations in 1996 (15 CFR Part 990). In developing those regulations, NOAA established a blue-ribbon panel of prominent economists and survey research experts to examine whether contingent valuation was sufficiently reliable to value natural resource injuries in damage assessments (NOAA 1993). The panel concluded that contingent valuation studies were indeed capable of producing reliable estimates of passive use values and provided a set of criteria for conducting such studies.

Although the *Exxon Valdez* oil spill affected three protected areas within the national park system—Kenai Fjords National Park, Katmai National Park and Preserve, and Aniakchak National Monument and Preserve—NPS had no spill response plan and no internal expertise to manage a damage assessment. As a result, opportunities to adequately assess injuries to NPS resources and recover appropriate compensation were lost (Kurtz 1995). In response, NPS created the Environmental Response, Damage Assessment, and Restoration Program in 1993 (Kurtz 1995; NPS 2005), now known as the Resource Protection Program. Enactment of the Comprehensive Environmental Response, Compensation, and Liability Act in 1980 and OPA in 1990 provided this new program the legal structure and tools to oversee the preparation of emergency response plans and assist parks that are impacted by oil spills or other hazardous substances. In addition, the Park System Resource Protection Act (16 USC 19jj), which was enacted in 1990 and re-codified as the System Unit Resource Protection Act in 2014 (SURPA; 54 USC 100721 et seq.), provided NPS with additional damage assessment authorities. By 2010, when the *Deepwater Horizon* oil spill—the largest in US history—occurred, NPS had both the legal authorities provided by OPA and an established program to administer them.

These disasters highlighted the need to better understand public values for impacted park resources, including those that arise independently of any direct use of parks. As noted by Boyle and Markowski (2003), if NPS fails to monetize passive-use value losses for damage claims or other policy applications, the public will not be fully compensated for changes to park system resources. As a result, these resources may degrade over time.

Individuals can assign both direct and passive use values to park resources. The term *total economic value* refers to the sum of both. Each of these components of value is certainly reflective of the NPS mission to preserve park resources unimpaired for the enjoyment, education, and inspiration of this and future generations. According to a recent study led by Colorado State University and Harvard University researchers, 95% of the American public said that protecting national parks for current and future generations is important to them whether they visit or not, and 81% would be willing to pay higher federal taxes to prevent cuts to national park units and ensure that the park system is protected and preserved (Haeefele et al. 2016a, 2016b).

Both visitor spending effects and net economic values were originally identified and discussed in the 1949 Prewitt report, but in different terms than are commonly used today. Together, they provide a comprehensive picture of economic benefits that is important to NPS. Until recently, NPS has been able to describe only part of this picture—that related to visitor spending effects. Now, with recently published estimates of net economic values, the entire picture of economic benefits can be described on a servicewide basis. Further, advancements in interdisciplinary approaches and modeling of ecological production functions have improved economists' ability to value ecosystem services. For example, using years of monitoring data and sophisticated models of expected ecological outcomes, Richardson et al. (2014) quantified the economic value of several ecosystem services affected by planned restoration activities in the central Everglades, including climate regulation, commercial and recreational fishing, improved water quality, and additional supplies of water.

How does understanding these economic benefits help the National Park Service?

Understanding the economic benefits supported by national parks helps NPS at different levels. It provides the tools to communicate the substantial return on investment NPS provides the American public. This allows NPS to reach audiences that are conversant with the economic justification of government programs, and thereby better advocate for its mission. For example, the VSE analysis tells us that every tax dollar invested in NPS returns approximately ten dollars of sales to the national economy (based on the NPS FY2016 enacted total budget authority of \$3,376,725,000). The net economic value study by Haeefele et al. (2016a, 2016b), which estimated \$92 billion in total economic value, demonstrates that NPS parks and programs *create* significant value for the American public, rather than just transfer spending from one economic sector to another. This shows that every tax dollar invested in NPS returns approximately 27 dollars to individual people in the form of net economic value. Further, that study demonstrates that the value of NPS's role to conserve park resources "unimpaired for future generations" is on a par with the value for on-site visitor use (\$33.5 billion in passive use value for parks compared with \$28.5 billion in direct use value). In

other words, economics has demonstrated significant support by the American public for all aspects of the NPS mission, including the mandate to conserve park resources and values.

Understanding these economic benefits also helps NPS at an operational level. In that regard, economics can help explain the relationships between park resource impacts and both visitor and non-visitor preferences. That understanding allows NPS to design effective visitor use management approaches at the park level. For example, environmental impact analysis under the National Environmental Policy Act can include economic analyses to explore human impacts associated with the affected environment, as was done in the recently completed long-term experimental and management plan for operations of Glen Canyon Dam. Nonmarket valuation techniques were used to determine the public's values associated with changes in dam operations. Compared with the no-action alternative, the analysis revealed very little variation in direct use values across the action alternatives, but significant variation in passive use values. Results demonstrated an annual increase of nearly \$4.5 billion in total economic value for implementing the preferred operations alternative. This was the highest such increase of all alternatives considered (US Department of the Interior 2016).

Economic analyses also help agencies such as NPS describe the benefits and costs of proposed regulations, as is required by Executive Order 12866. One such analysis was conducted in 2005 to evaluate the economic values associated with seven alternatives for regulating snowmobile use in Yellowstone National Park (Mansfield et al. 2005). This analysis was instrumental in promulgating the park's 2013 Winter Use Plan. Decisions surrounding entrance fees and passes to national parks can also be greatly informed by economic research. When Congress authorized a new series of interagency passes for federal recreation lands, NPS commissioned a study to assist agencies in pricing the annual pass. Using the contingent valuation method, Aadland et al. (2008, 2012) surveyed households across the US to determine how much people would be willing to pay for this new pass and how the revenues collected by the various agencies would be affected at different prices. This study helped policy-makers set an initial price of \$80 for the new pass.

Economic analyses also help determine appropriate mitigation under the Clean Water Act and compensation for injuries to park resources caused by incidents such as oil spills. For instance, the 2015 settlement of the *Deepwater Horizon* oil spill was facilitated by the use of economic analysis. Net economic values are frequently used to determine lost or diminished visitor use services under SURPA. These examples all demonstrate various uses of economics by NPS at the operational level.

Based on a survey of the American public, the total economic value of NPS parks and programs is estimated at \$92 billion. This includes \$28.5 billion in direct use benefits of national parks, \$33.5 billion in passive use benefits of national parks, and \$30 billion for NPS programs that operate outside the national parks, such as the National Natural Landmarks and Historic Preservation Tax Incentives programs.

Source: Haefele et al. 2016a, 2016b

There also exist a wide range of potential future and expanded uses of economics. For instance, NPS is planning a formal socioeconomic monitoring (SEM) program that would provide a standard visitor survey instrument and a long-term, systematic sampling design for in-park visitor surveys (see Pettebone and Meldrum, this volume.) Full implementation of the SEM program would result in more parks having primary survey data for estimating visitor spending effects and direct use values of park visitation.

Additionally, there is interest in understanding more about the virtual use of national parks. In 2016 alone, the website nps.gov had 90 million different visitors and 556 million pageviews. People from around the world spend millions of hours each year watching the popular Katmai National Park and Preserve bear webcams, hosted on the website explore.org. This “virtual visitation” generates significant public benefits and provides another avenue for the NPS to reach new and more diverse audiences. Efforts are underway to determine the economic value of this use and, thus, the return on investment in NPS digital resources. Additional future uses of economics include identifying the factors of park visits and experiences that are relevant to an evolving American public (*positioning use*) and negotiating benefits-sharing agreements under NPS Director’s Order 77-10 (*operational use*).

Conclusion

The ability to estimate and describe the economic benefits of national parks provides NPS with tools to advocate for its mission and design effective visitor use management approaches for park-level issues. In those ways, economic analysis enhances NPS’s ability to accomplish its mission to preserve unimpaired the resources and values of the national parks and to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout the world.

For the first time, economic analysis has been used to provide a comprehensive picture of the economic benefits that national parks provide to both communities and individual people. That picture shows a substantial return on investment that the National Park Service provides to the American public, giving context and meaning to the phrase “For the Benefit and Enjoyment of the People” that is inscribed on Yellowstone’s Roosevelt Arch.

Views and conclusions in this report are those of the authors and do not necessarily reflect policies of the National Park Service. Mention of trade names or commercial products does not constitute endorsement or recommendation for use by the National Park Service.

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