To: Cindy Osorto[cosorto@blm.gov]
From: Butts, Sally
Sent: 2017-03-29T17:40:46-04:00
Importance: Normal
Subject: Fwd: Briefing on NCL Econ report
Received: 2017-03-29T17:41:13-04:00
An Analysis of the Economic Effects of the National Conservation Lands Edited 03.21.2017.pdf

Cindy,
I updated the report with a few missing words. I sent the updated version to Rebecca a bit ago.

Sally

An Analysis of the Economic Effects of the Nati...

---------- Forwarded message ----------
From: **Osorto, Cindy** <cosorto@blm.gov>
Date: Wed, Mar 29, 2017 at 11:38 AM
Subject: Re: Briefing on NCL Econ report
To: "Sidon, Joshua" <jsidon@blm.gov>, Rebecca Moore <rmoore@blm.gov>
Cc: Robert Winthrop <rwinthro@blm.gov>, "Butts, Sally" <sbutts@blm.gov>

Hi Rebecca,
I'm sorry if there was any misunderstanding. I had understood that Egan had already sent out and received all feedback for his report.

Attached below is the latest draft version of the report. Please let me know if you have any feedback.

I understand the briefing was rescheduled for next week.

Regards,

Cindy

On Wed, Mar 29, 2017 at 10:53 AM, Sidon, Joshua <jsidon@blm.gov> wrote:

> Links to final documents...provided to me by Cindy as part of discussions for how to incorporate the study's findings into the DOI Economic report and Sound Investment. I haven't reviewed them.

Josh

4 Page Economic Fact Sheet.pdf

An Analysis of the Economic Effects of the Nati...

Appendices to Economic Report.docx

Short Fact Sheet.pdf

w-InvestmentinAmerica-1-31-17 Briefing Doc.docx

On Wed, Mar 29, 2017 at 7:51 AM, Rebecca Moore <rmoore@blm.gov> wrote:

How did this get to the ASLM already? I expected to see and work on a revised draft before it went to the Director, much less the AS. Egan's great, but there was a lot of polishing to do.

Did you have a finished version?

-R

-----Original Message-----
From: Robert Winthrop [mailto:rwinthro@blm.gov]
Sent: Wednesday, March 29, 2017 7:21 AM
To: Rebecca Moore <rmoore@blm.gov>
Cc: Anthony Bobo <a1bobo@blm.gov>
Subject: Briefing on NCL Econ report

Please see Nikki Moore's request re briefing today on Egan's study. I hope you can join.

Rob

Rob Winthrop
Socioeconomics Program (WO-210)
USDI Bureau of Land Management
202-912-7287 (w); 202-341-4837 (c)

--
Josh Sidon
Economist, National Operations Center
Bureau of Land Management
Denver Federal Center, Bldg. 50
P.O. 25047
Denver, CO 80225
Phone: 303 236 6343

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Cindy G. Osorto
Planning & Environmental Specialist
National Conservation Lands (WO-410)
Bureau of Land Management
20 M Street SE Washington, DC 20003
Email: cosorto@blm.gov Office: (202) 912-7476

--
Sally R. Butts, J.D., Acting Division Chief
National Conservation Lands
Bureau of Land Management
20 M St. SE, Washington, DC 20003
Office 202-912-7170; Cell 202-695-5889; Fax 202-245-0050; sbutts@blm.gov

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NATIONAL CONSERVATION LANDS

An Analysis of the Economic Effects of the National Conservation Lands

February 17, 2017

FOIA001:01688189

Prepared by Egan Cornachione

GeoCorps Intern with the Bureau of Land Management, Division of National Conservation Lands

DRAFT

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-An appendix to this report with additional information is available upon request.-

Executive Summary

This report assesses several aspects of the economics of the National Conservation Lands. There are many ways to understand how protected public lands fit into regional economies and the benefits they provide to people. This report explains several economic concepts important to understanding the National Conservation Lands, and generates peer-reviewed research and statistics used to better understand the economic implications of these lands. This report includes:

1. A discussion of the economic theory and concepts related to the National Conservation Lands:

- Clarifying the distinction between economic value, contributions, and impacts; defining ecosystem services; and explaining a total economic value framework.
- Describes a method for understanding the **effects of a National Monument designation** on a community economy. The economic effects of a monument designation depend on a number of factors and may be positive or negative and short- or long-lasting based on these factors.

2. Economic statistics, facts and stories that can be used to discuss the economic effects of these lands:

- Assessing the **economic contributions** of National Conservation Lands. Based on a peer-reviewed model described within this report, visitors to National Monuments, National Conservation Areas (NCAs), and similarly designated units spent ~~over~~ nearly $460 million on trip-related purchases in 2016. This contributed an estimated $630 million in economic activity, 7,100 jobs, and $230 million in incomes to state economies. This supports a return of $17 of regional economic output per $1 of program funding.
- Analyzing trends in **visitation** to units. Visitation to National Monuments, NCAs and similarly designated units increases at an average rate of around 5.4% per year. Comparatively, visitation to all BLM recreation sites increases at around 1.3% per year.
- Describing **the nonmarket values and ecosystem services** of the National Conservation Lands. Many of the National Conservation Lands are free to use and they protect valuable resources not bought or sold in markets, so their benefits are calculated through *nonmarket valuation* methods. For example, the recreational opportunities at the Deschutes Wild and Scenic River are valued at over $29 million in economic use value for 2016.

3. A demonstration of how the economic concepts and statistics generated in this report may be applied for future uses and analyses:

- Analyzing a single National Monument as a **case study**. This demonstrates how the statistics, economic concepts and framework provided in this report can be applied to an individual unit.
- Providing examples of economic cases from different National Monuments and NCAs.
- Developing a website, fact sheet, and appendix to this report in order to share the economic benefits of the National Conservation Lands with other part of the agency and the public.

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At-A-Glance: Economic Contributions of National Monuments and National Conservation Areas

The figure below shows the visitation and associated visitor spending at all National Monuments and National Conservation Areas in 2016. The expenditures within 50 miles of a site were calculated by using recreation visitor spending profiles generated from the National Park Service. Jobs supported, labor income, value added, and economic output for each state's economy were calculated from IMPLAN economic modeling software.

NATIONAL CONSERVATION LANDS

Regional Economic Contributions of National Monuments and National Conservation Areas

Site Name	All Monuments and NCAs

Visits (2016)	8,671,083
15yr Average Annual Visitation Growth	5.43%
15yr Median Annual Visitation Growth	2.01%

Acres	12,230,366

2016 Visitor Spending by Sector

Table 1: Economic Contributions from Visitors to All Monuments and NCAs

Average Expenditures per Visit	$52.94
Total Expenditures	$459,080,688
Non-BLM Jobs Supported	7,143
Labor Income Supported	$233,365,188
Value Added	$372,086,054
Total Economic Output Supported	$634,457,798

Table 2: Budget, Volunteer Hours, and Revenue

FY15 Budget	$36,866,000
Volunteer Hours (2015)	248,582
Value of Volunteer Contributions	$5,739,351
FY16 Revenue	$7,759,404

Table 3: Economic Contributions in Context

Economic output supported per $1 of FY15 budget	$17.21
Economic output supported per acre	$51.88

Table 4: Previous Year Economic Contributions

FY 2014 (in $2013)				FY 2015 (in $2014)			
Visits	Total Spending	Jobs Supported	Output Supported	Visits	Total Spending	Jobs Supported	Output Supported
7,527,638	$376,112,905	5,867	$507,642,214	7,181,823	$371,766,254	6,014	$528,701,400

Sources: Visitation and visitation growth data were gathered from DOI's Recreation Management Information System (RMIS), as accessed on December 2016. Acreage, budget, and volunteer hours are as reported in BLM FY15 Managers' Reports. The Value of Volunteer Contributions was calculated using state by state value per hour of volunteer time from https://www.independentsector.org/volunteer time. Economic contributions results were estimated by assigning visitor characteristics and spending patterns based on visitor surveys of the nearest National Park Service unit (based on data from Thomas and Koontz 2015: https://www.nps.gov/nature/customcf/NPS_Data_Visualization/NPS_VSE_2015_FINAL.pdf.). Contributions results were calculated from IMPLAN economic modeling (http://implan.com/). Visitation growth rate may be

based on fewer than 15 years due to data availability.

NATIONAL CONSERVATION LANDS

Regional Economic Contributions of National Monuments and National Conservation Areas

Site Name	All
State	All
Date of Designation	-

Visits (2016)	8,722,228
15yr Average Annual Visitation Growth	5.43%
15yr Median Annual Visitation Growth	2.01%

Acres	12,230,366
USFS Comparison Site	0
NPS Comparison Site	0

2016 Visitor Spending by Sector

Table 1: Economic Contributions from Visitors to All

	USFS	Average	NPS
Average Expenditures per Visit	$47.30	$50.13	$52.97
Total Expenditures	$412,569,037	$437,284,591	$462,000,146
Non-BLM Jobs Supported	4,813	5,978	7,143
Labor Income Supported	$153,643,187	$193,504,187	$233,365,188
Value Added	$244,461,988	$308,274,021	$372,086,054
Total Economic Output Supported	$425,530,575	$529,994,187	$634,457,798

Table 2: Budget, Volunteer Hours, and Revenue

FY15 Budget	$36,866,000
Volunteer Hours (2015)	248,582
Value of Volunteer Contributions	$5,739,351
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	7,527,638	$376,112,905	5,867	$507,642,214	7,181,823	$371,766,254	6,014	$528,701,400

Sources: Visitation data, visitation growth both from RMIS Accessed December 2016. Acreage, budget, volunteer hours as reported in FY15 Manager's Reports. Value of Volunteer Contributions calculated using state-by-state value per hour of volunteer time from https://www.independentsector.org/volunteer_time. "USFS" contributions results estimated by assigning visitor characteristics based on visitors to nearest National Forest (taken from USFS National Visitor Use Monitoring Survey Round 2). "NPS" contributions results estimated by assigning visitor characteristics based on visitors to nearest National Park Service unit (based on data from Thomas and Koontz 2015: https://www.nps.gov/nature/customcf/NPS_Data_Visualization/NPS_VSE_2015_FINAL.pdf.). Contributions results calculated from IMPLAN economic modeling (http://implan.com/). Pie chart displays visitor spending from "NPS" spending profiles.

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Section 1: Introduction

This report is meant to address the economic implications of the Bureau of Land Management's (BLM) National Conservation Lands. The economic effects that National Conservation Lands have on local, regional and national economies are of interest to stakeholders including the BLM, federal decision makers, business groups, communities near these lands, and the general public. This peer-reviewed report and the statistics generated from it are intended to be used as a resource for those interested in the economic considerations relevant to the National Conservation Lands.

The National Conservation Lands are a system of 876 federally recognized units, comprising nearly 36 million acres. They include 27 National Monuments like Fort Ord National Monument in California; 21 NCAs and similarly designated units such as Yaquina Head Outstanding Natural Area; 223 Wilderness Areas such as the Bisti/De-Na-Zin Wilderness in New Mexico; 517 Wilderness Study Areas; 69 National Wild and Scenic Rivers and 18 National Scenic and Historic Trails.

Many of the statistics generated from this report focus on National Monuments and NCAs because they are the only areas that report program-wide visitation amounts. The economic concepts underlying these analyses are applicable, however, with proper consideration, to all of the protected public lands designations of the National Conservation Lands. National Monuments and NCAs are designated either by Congress or the President to conserve culturally and scientifically important resources, objects and values for the benefit of current and future generations. This report addresses how these resources, objects and values provide an accessible framework for analyzing the economic value of units.

Designating a National Monument or NCA prioritizes conservation on these lands and as such, their value stems from the conservation-related activities and resources on these units. Typically, leases for the many forms of resource extraction are withdrawn once an area is designated as a National Monument or NCA, but valid existing rights are honored and other activities that are compatible with the designation are allowed. This means that several sources of *market* values associated with BLM-managed lands generally do not occur on National Conservation Lands. Conservation-related activities, however, provide other types of economic value. For example, one of the most visible benefits of protected lands comes from their recreational values. Many monuments have become or are becoming high-profile destinations for tourists who spend hundreds of millions of dollars annually on trip-related purchases. Grand Staircase-Escalante National Monument in Utah has grown from hosting just over a half million visits in 2000 to nearly a million visits in 2016.

As nationally-treasured landscapes, the National Conservation Lands are also valued by many people who may never visit the units but place importance on protecting the land and its resources (Loomis 2000). Many areas are attractions for out-of-state and foreign tourists who support regional economies by travelling through areas with protected public lands and purchasing local goods and services. Beyond these recreation values, monuments and NCAs provide other important services that can support local economies. Studies have directly or indirectly linked positive trends in home values, lower water bills, reduced frequency of natural disasters, and increased local crop productivity to the presence of protected public lands (Taylor et al 2012, Gosnell and Abrams 2011, Ricketts et al 2008 and Rasker 2012).

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This report is intended for a variety of stakeholders and may be useful in several contexts. Within the BLM, the information may be useful for planners analyzing the socioeconomic effects of projects or policies relating to the National Conservation Lands. The information in the results section of this report provides statistics for communicating regarding the economic activity and economic value of the National Conservation Lands. The definitions, explanations, and examples of various economic concepts contained within this report are intended to aid non-specialists in understanding the economics of the National Conservation Lands. Finally, the framework for evaluating the economic effects of a new designation and monument case study may be used to inform planning and address local and regional economic concerns relating to a designated unit.

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Section 2: Economic Concepts of the National Conservation Lands

2.1: Defining Economic Value and Economic Contributions

An economic analysis distinguishes between economic values, and economic contributions or impacts. Economic value, also referred to as economic benefit, is a measure of what a good or service is worth to people. The economic value of the National Conservation Lands is measured by the benefits that people gain from the goods and services these lands provide. Economic *contributions* are a dollar measure of regional economic activity associated with a particular industry or business sector. Economic *activity* is the production, distribution, and consumption of goods and services in an area. An economic *impact* is a change in economic activity resulting from an action. For example, the changes in regional economic activity due to an area's National Conservation Lands units represent an economic impact.

Defining Economic Terms:

Value: how much a good or service is worth.

Contribution: an amount of economic activity generated from an action.

Activity: the production, distribution and consumption of goods and services in a specified region.

Impact: the change in economic activity resulting from a particular event.

Economic value and economic contributions or impacts are two separate concepts that both help explain the relationship between National Conservation Lands and regional economies. Contributions analyses provide a macroeconomic perspective on how regional economies are impacted by National Conservation Lands visitation. Valuation studies demonstrate how *people* are affected by the resources provided by the lands, as represented by their willingness to pay for these resources. Economic contributions can fit into a discussion of economic value but they are, quantitatively, measuring two different things.

A discussion or analysis of economic value should account for variation in values across different locations, time frames, and groups of people. Such differences in the geographic or temporal scope of benefits, or variation across groups, can present important policy or management challenges and affect which values are most relevant to a particular decision. For example, the benefits of providing a clean water source to a neighboring community are relatively local, while the existence value associated with protecting an endangered species might be global. The decision context will determine if and how these values should be considered.

2.2: Types of Economic Values

Economic values can be characterized several different ways. Some values are associated with land uses, while others are associated with *non*-uses. Use values can be additionally categorized as being *directly* or *indirectly* associated with a use of the land. National Conservation Lands units have components of direct use, indirect use and non-use values. Figure 1 shows total economic value, measured as the sum of all of these values.

Economic values may differ by *how* they are valued. Analysts can estimate some values, such as resource values of oil or other minerals, from market data about the buying and selling patterns of the

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commodity. However, many values associated with conservation, such as habitat protection, are not directly captured in market activity. These resources are not conventionally bought and sold, and must be measured indirectly by methods such as observing markets for related goods, or by creating a hypothetical market in which to observe choices. National Conservation Lands hold a vast number of scientific, cultural, habitat, geologic, and archaeological resources, among many others. Most of these resources are not purchased or sold in markets in the same way of other BLM-managed resources like oil, timber, minerals and coal. Since National Conservation Lands have few existing leases for these market-valued resources, nonmarket values constitute a significant portion of the values associated with the management of the National Conservation Lands.

Figure 1: Total Economic Value (Adapted from Huber and Richardson 2016 and Loomis 2002)

Table 1: Defining Use vs. Non-Use Values and Market vs. Nonmarket Values

Direct Use Value	Direct use values require direct interaction with the resource or land. For example, recreation, mineral extraction and water withdrawal are all values captured by directly using the resources provided by the land.
Indirect Use Value	Indirect use values are the benefits to people that do not require direct interaction with the resource or land. For example, a healthy water supply may be supported by groundwater recharge within a National Conservation Lands unit. People reap this clean water supply benefit without physically interacting with the land, making it an indirect use value.
Non-Use Value	Non-use values are benefits derived without using the lands' resources either directly or indirectly. Non-use values may be expressed by peoples' willingness to pay for protection of resources or values that they will not use. There are three main categories of non-use values: *Existence Value*: valuing the current intactness of a landscape and its resources without using them. *Option Value*: valuing a landscape or resource for having the option of using it at some point in the future. *Bequest Value*: valuing the continued existence of a resource for use by future generations.

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Market Values	Competitive markets establish prices for the sale and purchase of goods and services. Values of market goods and services may be calculated by observing and analyzing market decisions. A good or service provided by National Conservation Lands that is traded in a competitive market may be valued by market activity.
Nonmarket Values	Many goods and services provided by National Conservation Lands are not traded in markets and thus are not valued through market activity. Goods and services such as clean air, pristine views, and the values ascribed to recreational experiences are examples of nonmarket values. The public values these resources or activities, but they are not usually sold or purchased. These nonmarket values may be measured or explained both quantitatively and qualitatively by a variety of economic techniques.

2.2.1 Nonmarket Values

BLM Instruction Memorandum (IM) 2013-131 provides administrative guidance for integrating nonmarket values into planning processes. Although nonmarket values may be challenging to measure, the guidance states that EIS-level NEPA analyses must include consideration of nonmarket values where relevant and feasible. The impetus for this mandate is that if nonmarket values are not included in an analysis when they do in fact exist, then planners or decision makers are implicitly devaluing a public good rather than applying the best available science on public values. From the IM:

> *"All BLM managers and staff are directed to utilize estimates of nonmarket environmental values in NEPA analysis supporting planning and other decision-making where relevant and feasible, in accordance with the attached guidance. At least a qualitative description of the most relevant nonmarket values should be included for the affected environment and the impacts of alternatives in NEPA analyses involving environmental impact statements (EIS), for both resource management plans and project-level decisions…"*

The guidance goes on to enumerate the three criteria that determine whether a quantitative nonmarket valuation is warranted.

> *1. A proposed action is likely to have a significant direct or indirect effect (as defined at 40 CFR 1508.8 and 1508.27), and the quality or magnitude of the effect can be clarified through the analysis of nonmarket values. For example, a proposed wind energy installation may affect the viewshed of a nearby community in ways that alter scenic values.*
>
> *2. The alternatives to be considered present a strong contrast between extractive and non-extractive uses of land and resources. For example, an RMP may include alternative resource allocations that vary between managing land primarily for oil and gas development or managing it for habitat conservation and recreation.*
>
> *3. The magnitude of the proposed change is large. An example could be the difference between a maximum allowable oil and gas development of 250 wells under the no-action alternative and 2,500 wells under the intensive use alternative."*

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In the case of decisions involving National Conservation Lands, the designations often restrict the types of future allowable uses of the land. Similarly, given the many resources, objects and values that National Conservation Lands are managed to protect, project decisions may have a significant direct or indirect effect on these values as described in the first criterion above. Cases such as these present management challenges that may be addressed through the inclusion of nonmarket values in decision-making.

2.2.2 Ecosystem Services:

A particularly useful concept for considering the full range of values provided by protected public lands is that of ecosystem services, which are generally defined as the benefits provided to people by nature. Although ecosystem services support economic activity, many are characterized by their economic value. Additionally, ecosystem service values often fall under nonmarket values. This concept bridges the historical divide created between the economy and the environment by describing the connection between the environment and the economy. Not all values related to National Conservation Lands are ecosystem services, but many are. These values may be classified into the four categories identified below (Millennium Ecosystem Assessment 2005).

Four Categories of Ecosystem Services (Millennium Ecosystem Assessment 2005)

- *Provisioning Services*: Providing food, materials, or other resources that are used to meet the needs of people.
- *Regulating Services*: Protecting the population from natural disasters such as floods; maintaining healthy air quality.
- *Supporting Services*: Providing resources for wildlife, and preserving biodiversity in ecosystems.
- *Cultural Services*: Ensuring an emotionally, spiritually, and physically healthy population; offering recreation opportunities.

Conservation is a management objective that contributes to the BLM's multiple use and sustained yield mission and requires adequate consideration the economic value of these services in decision-making. Executive Branch guidance issued in October 2015 "directs agencies to implement {ecosystem services} policies and integrate assessments of ecosystem services, at the appropriate scale, into relevant programs and projects, in accordance with their statutory authority" (Executive Office Memorandum M-16-01). The BLM is currently developing additional guidance for considering ecosystem service values in NEPA analyses and planning efforts in response to this order. As this guidance is released, it will become necessary for planners to include a discussion and/or valuation of ecosystem services where relevant to decision-making (PCAST 2011). In cases involving National Monuments and NCAs, the resources, objects and values for which the units are designated are a useful starting point for understanding ecosystem services at the unit-level.

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2.3 Regional Economic Contribution Analysis

A regional economic contribution analysis can be used to estimate the activity generated in an economy as a result of visitors spending money on their trips to a National Conservation Lands unit. In a contribution analysis, an input-output (IO) model simulates an economy and tracks the linkages among different sectors of an economy. IO models track the flow of goods and services from their production to their sale. For example, consider $100 spent at a local restaurant as part of a National Conservation Lands visit. Of that $100, perhaps $40 is used to purchase ingredients from the local region, $30 goes towards rent and building maintenance and $30 goes towards wages and profit. All $100 of visitor spending is a direct effect because the money stays within the region. Looking specifically at the $40 going towards ingredients, businesses that sell ingredients to the restaurant are indirectly affected and they, too, will spend that money on various inputs. These are called indirect effects. In the case of the $30 of wages, some of that money will be spent by the employees on various necessities in the same region, leading to "induced" effects. The direct, indirect and induced effects are traced throughout the economy until all dollars are either saved or spent outside the economy.

This report uses IMPLAN, an IO modeling software, to estimate regional economic contributions (IMPLAN 2016). IMPLAN is used by many federal agencies to perform analyses of regional economic contributions (Thomas and Koontz 2016). The software uses a vast accounting matrix to estimate direct, indirect and induced effects generated from a particular event, activity, or industry. In the case of visitor spending analysis, the "activity" is the spending related to National Conservation Lands visits. The outputs generated from visitor spending are measured by the following (adapted from Thomas and Koontz 2016):

Jobs: the annual average of monthly jobs, both part-time and full-time. One part-time or full-time job lasting twelve months is equivalent to two part-time or full-time jobs lasting six months. Note that these jobs are those supported by visitor spending, not necessarily jobs "created" by the unit. Some of the reported jobs would still exist without tourism generated from the National Conservation Lands unit. Additionally, since this analysis only tracks visitor spending on trip-related goods and services, it does not directly calculate jobs associated with monument management. For the most part, BLM jobs are distinct from other jobs supported by visitation measured in an IMPLAN analysis.

Labor Income: all forms of employment income, including wages, benefits, and proprietor income. Labor income represents a portion the amount reported for value added.

Value Added: the contribution of visitor spending to the Gross Domestic Product (GDP) of a regional economy. Value added is equal to the difference between the sale price of all goods sold and the production value of the goods. In other words, if a consumer spent $100 at a motel and the operational and material expenses of the business to provide that room were $40, then $60 of value is added to the economy upon the item's sale.

Output: the total production value of goods and services supported by visitor spending. It is the sum of consumer purchases, exports, and intermediate sales between businesses.

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Section 3: A Framework for Analyzing the Economic Value of National Conservation Lands

3.1: Introduction to Resources, Objects and Values

Each of the 48 BLM National Monuments and National Conservation Areas is designated to conserve specific resources, objects and values (informally called ROVs). A chart showing the types of ROVs for which the units are designated is shown in Table 2. As the chart shows, the most common values the units are designated to protect are cultural, wildlife habitat, and scientific. Although all units offer recreational opportunities, not all sites are designated specifically to conserve recreational values.

Each type of resource, object and value for which a unit is designated has an associated economic value because they are *worth* something to people. With cultural resources, for example, visitors who value the opportunity of getting to see, touch, or experience a preserved cultural site. Additionally, local residents who value a strong community and maintaining cultural ties may receive an indirect benefit from this use of the resource, as values associated with a sense of place are enhanced by having access to the site. Additionally, people who live far away from the site but who value it will likely benefit from knowing that the site is preserved (a non-use value).

Resource, Objects and Values	Number of Units Designated to Protect ROV
Cultural	**34**
Habitat/Wildlife	**33**
Scientific	**32**
Paleontological/Geological	**27**
Vegetative/Ecological	**25**
Recreational	**19**
Riparian/Water	**19**
Educational	**18**

Table 2: Resources, Objects and Values of National Monuments and NCAs

Table C2, in Appendix C of this report, provides a guide for identifying, describing and, possibly, quantifying the economic value of National Monuments and NCAs through the direct use, indirect use, and non-use values of the units' resources. For each ROV, economic values from the three main components are identified.

Some values are easily captured while others are difficult to quantify, but according to BLM IM 2013-131, "the most relevant nonmarket values" should be considered when a decision is found to warrant nonmarket valuation. In planning or in project assessments a qualitative description of the values may be used when no quantitative data is available (BLM IM 2013-131). The framework in Appendix C provides a list of valuation methods that, while not exhaustive, can assist in conducting an economic analysis. Most valuation techniques require the support of a professional economist, but if an economist is not available, this table can aid a non-specialist in identifying and describing economic values of a unit. See section 5 and *Featured Unit: Grand Staircase-Escalante National Monument* for an example of how some of these values can be

Example: The Economic Effect of a Rock Climbing Conference

Many large conferences and events take place on National Monuments and NCAs as a result of the incredible objects and values they conserve. Red Rock Canyon National Conservation Area hosted the Mountain Gear Red Rock Rendezvous in April 2016. According to Christensen Research Company, 97% of attendees came from outside the Las Vegas area and 43% flew in for the event. The three-day event brought in an estimated $1 million in festival-related spending to the Las Vegas economy.

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monetized, and Appendices A and B for methodologies of a few of the valuation techniques listed.

Although not all designated for protection of certain ROVs, the units managed in the other National Conservation Lands program areas can be analyzed under a similar framework. Non-monument units may have values associated with a particular ROV, so this same framework can be applied.

3.2 Local Economic Opportunity, Stability, and Diversity and National Monuments and NCAs

Different from, but related to, the resources, objects and values of a designation is the value of local economic opportunity related to a National Conservation Lands designation. A strong, diverse, and stable economy is of value to a local community and public lands contribute to this value. Although this value is not easily quantified, a regional economic contribution analysis is one useful tool to aid in understanding the value of local economic opportunity. The jobs, labor income, value added, and economic output supported by National Conservation Lands visitors and other events taking place on the lands do not represent an economic value but they are useful in understanding the total value of the units. If many jobs are supported by monument visitation in a relatively small local economy, then the monument provides a great amount of economic *opportunity*. If there are many additional types of employment in the community, then the monument also supports a *diverse* local economy. Finally, visitation to BLM sites tends to increase over time (RMIS 2016). The continued or sustained economic activity generated as a result of this visitation supports economic *stability*.

Section 4: Assessing the Economic Effects of a National Conservation Lands Designation

4.1: Potential Socioeconomic Effects to Local Communities of Protected Land Designations

An important question that the National Conservation Lands often face regards the impact a designation has on a local economy. A monument or NCA designation can, in some cases, impact the growth potential of different economic sectors by prohibiting certain new uses of the land. Understanding if and how these impacts might occur is an important consideration. A positive economic impact may be generated from increased tourism after the designation of a unit. The naming of a designation can affect a location's recognition and the amount of visitation it receives. Weiler and Seidl (2004) demonstrated that annual visitation to National Park Service units that were formerly designated as National Monuments increased significantly after they were re-designated as National Parks, controlling for other factors that might impact visitation. Although National Parks and BLM National Monuments are not directly comparable, the study provides peer-reviewed evidence that the naming of a public land designation is important, and visitation may increase in response to a more recognizable monument naming. The increased visitation after a designation brings additional visitor spending and generates additional economic activity in the region.

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A 2011 study by Headwaters Economics, updated in 2014, analyzed the economic performance of counties surrounding National Monuments designated since between 1982 and 2000 with a size greater than 10,000 acres. In the communities surrounding each of the thirteen BLM National Monuments analyzed, trends in population, employment, personal income, and per-capita income all increased after the monuments were designated. Two thirds of communities surrounding the seventeen total monuments studied grew at the same or faster pace as similar counties in the states of the designations (Headwaters Economics 2014).

Designation Effect: Rio Grande del Norte NM

Rio Grande del Norte, a vast unit outside of Taos, New Mexico, saw visitation jump from 111,000 in 2012 to 166,000 in its year of designation in 2013. This nearly 50% increase in visitation helped boost Taos' Accommodations and Food Service tax revenues by a half million dollars from the previous year. Retail Trade tax revenues increased nearly 10% or $850,000 between 2012 and 2013. Though not all necessarily attributable to the monument designation, these revenues were likely supported by the visitation boost from its designation.

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Featured Unit: Grand Staircase-Escalante National Monument

BLM's first monument, Grand Staircase-Escalante in southern Utah, exemplifies many concepts of economic value.

Recreational Value

Throughout the year, numerous guide services take visitors into the monument to experience its outstanding recreational opportunities. The monument had 117 active Special Recreation Permits (SRPs) in 2016. Many of these permits were for commercial outfitters who often attract non-local and even foreign tourists for multi-day stays in the area. The Escalante Canyon Art Festival, an event lasting over a week each fall in the monument, brought in more than 5,000 people from over fifteen states and three countries to stay in the area in 2016.

Educational Value

Escalante Partners, an official nonprofit partner organization of the monument, provides several free resources for educators across the state, including "Discovery Trunks." These trunks, developed from the unit's geologic resources, offer an integrative way for students to learn about the geology, archaeology and paleontology that Grand Staircase Escalante conserves.

Scientific and Paleontological Value

Grand Staircase-Escalante provides a staffed paleontological laboratory with 10 work stations open to volunteers who can help with the preparation of the unit's remarkable fossil discoveries. Over 500 journal articles have been published about the monument and its resources, a collection of which is available for public access through the Gerald H Sherratt Library at Southern Utah University.

Wildlife/Habitat Value

Grand Staircase-Escalante encompasses nearly 2 million acres in the Colorado Plateau, a region that conserves over 550 different species of pollinators. Pollinators are crucial to agricultural production. Pollinators contributed an estimated $29 billion in economic output nationally for farms in 2010 (Calderone 2012).

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The literature also cites several other examples besides tourism of how a protected public land designation can impact local economies.

- Amenity migration: retirees, skilled workers, and businesses are attracted to communities with large amounts of protected public land (Gosnell and Adams 2009).
- Changes in Property Values: home values increase in relation to their proximity to protected public lands, all other factors being equal (Taylor et al 2012, Izon et al 2010, Phillips 2004).
- Tax Revenues: spending associated with visitation generates local tax revenues from sectors such as retail trade, accommodation and food services, and arts, entertainment, and recreation.

Amenity Migration in Action

Many National Monuments and National Conservation Areas can now be reviewed on Yelp. These reviews can provide useful insight into what motivates people to visit units. One reviewer who identified as a Las Cruces resident, called Aguirre Springs National Recreation Area, a unit within Organ Mountains-Desert Peaks National Monument, "…one of my favorite places in Las Cruces." Another review states, "this place is one of the reasons I moved to [Las] Cruces." Comments like these provide evidence that monuments are not only important to tourists, but they influence residents' decisions to locate in a particular area.

To be clear, the peer-reviewed literature shows that the described effects *can* be associated with a designation, not necessarily that this is the case in every community. BLM National Monuments and NCAs vary considerably in their size, amenities, and visitation. For example, the smallest unit, Piedras Blancas Historic Light Station, sits on only 18 acres on the California Coast, while the largest unit, Grand Staircase-Escalante (GSENM), encompasses almost 1.9 million acres. These two sites also demonstrate the range of contrast in visitation among sites, as the light station attracted less than 10,000 visits in 2016 while GSENM hosted nearly 1 million visits. Additionally, some sites are in very remote areas, while others are just miles from some of the largest cities in the west. Given the wide variety of National Conservation Lands unit types, locations and recreation opportunities, it is impractical to draw generalizations about the economic effect a designation can have on a community. While there is evidence that National Monuments and NCAs can positively affect local economies after designation, the likelihood and magnitude of these effects depends on many different factors.

4.2: Factors Influencing Changes in Visitation to National Conservation Lands Designations

Perhaps the best way to address the question of the economic impact of a monument designation is by understanding the factors that are most likely influence visitation to the unit. A National Monument designation provides name recognition that can have a positive short-term impact on visitation (Weiler and Seidl 2004). The long-run impact, however, depends on many different factors both internal and external to the BLM's management decisions. Evidenced by a 5.4% average annual growth rate for designated units, many National Monuments and NCAs are increasingly becoming popular tourist destinations for visitors from the United States and abroad. Visitation to a unit depends on a number of important factors, though, and understanding these factors for all types of units provides a basis for evaluating how a designation may affect visitor use of the unit. The table below lists the factors that, based on peer-reviewed research, quantitative data, and anecdotal evidence, may influence visitation. These factors may be evaluated to help characterize the short- and long-run visitation prospects of a designation, and several factors may influence the *effect* a designation can have on visitation.

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Table 5: Factors Influencing Unit Visitation

Type of amenities and recreation opportunities offered at the unit	The type of recreation a unit offers influences the degree to which it attracts visitors. The most participated-in activity across all BLM sites in 2016 was education, interpretation and nature study, followed by non-motorized travel and camping/picnicking. Visitors choose to travel based on what recreation sites offer for their experience. A survey of Texas State Parks visitors asked visitors to rate the importance of various amenities in attracting them to a park on a scale from 1 to 5. They found that "pretty scenery" (4.40 average value), "historical sites" (3.90), "interesting wildlife" (3.57), "good highways" (4.29), and "providing a good value" (4.57) were most important to visitors (Walker et al 2005). National Conservation Lands amenities such as visitor's centers, educational displays, interpretive programs, boat launches, and paved roads all very likely play a role in bringing visitors to the monument.
Urban / Rural location	Proximity to urban areas is important, as about half of all visitors to BLM lands travel less than 50 miles from home to reach their recreation site according to data from the 2006 and 2009 BLM National Visitor Use Monitoring Process (White nd). Non-local visitors spend the most money on their visits, although locals still generate economic activity on their trip-related expenditures (Thomas and Koontz 2016). Additionally, units located less than 50 miles from major population centers are more likely to experience visitation growth, as they benefit from the ease of access (Rasker et al 2009).
Population served	Demographics are an important factor in visitation. The most common visitors to natural areas are white, male, older, and have higher incomes. The most recent survey of United States Forest Service visitors found that 95% of visitors are white, 52% are over 40, 63% are male, and 72% had household incomes greater than $50,000 (USFS 2015). These statistics are useful in understanding which groups use National Conservation Lands and which populations may perhaps be better served by public lands in the future.
Resources, Objects, and Values of Designation	The ROVs of a designation establish management objectives for the unit. Demand for different resources varies across time, space, and different populations. Additionally, conservation objectives may compete with visitation growth. For example, Wilderness Areas must, by designation, be roadless areas (Wilderness Act of 1964). A lack of development helps protect the wilderness qualities and conserve the important resources of an area, but it can also hinder visitation growth by limiting opportunities for human access.
Ease of access/ transportation	A 2015 report by Headwaters Economics found that rural counties that are "connected" to major metropolitan centers fare better in major economic performance indicators than "isolated" counties (Rasker et al 2009). A connected county was defined as having a population center within one-hour commuting distance of the nearest airport with daily passenger service. As a result of this relationship, units that are more easily accessible either from roads or major airports may experience greater visitation. This is an important factor to consider when analyzing the potential effects of a designation. If the unit is accessible by a major highway and connected to large population centers by an airport, it may be more likely to experience greater visitation effects than a similar unit that is less connected.
Substitutable recreation sites	The most recent survey of National Forest visitors found that 60% of visitors in the western United States regions indicated that they would travel somewhere else for their visit if they were not able to visit the Forest Service unit they had chosen as their destination. Of these 60% of survey respondents, 36% indicated they would only travel up to 25 miles to their "substitute" site (USFS 2015). People were comparatively less willing to travel greater distances to travel to a substitute destination. A site with fewer substitutes- especially within a 25-mile proximity- makes visitor demand more inelastic, meaning they would pay more for a similar amount of recreation opportunities since they cannot easily shift their consumption away from the unit. This would theoretically increase the value per visitor of having recreation opportunities at the unit, although it may not impact economic activity. On the other hand, areas with many substitutes may attract visitors who spend time at multiple units. A higher availability of substitutes may increase visitation to a unit that might otherwise be less-visited. While the number of available substitute recreation sites may not directly explain why certain areas are more or less visited than others, it is an important part of explaining patterns in visitation and planning for future changes.

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Local partnerships, knowledge, and activism	Active partnerships with local organizations are highly important in garnering public interest and visitation to monuments. For example, the Las Cruces Green Chamber of Commerce helped put on a "Monuments to Main Street" event which hosted several activities on the Organ Mountains-Desert Peaks National Monument. These kinds of events directly bring people to monuments that otherwise may not have visited without the support of the local community. Thanks in part to the activism of local community members, the Las Cruces area has seen five consecutive years of tourism growth (Tourism Economics 2016). Additionally, partnerships with schools, local officials, and businesses all may help to attract visitors. National Conservation Lands units with these partnerships may be more capable of attracting visitors. Many units have partner groups included in the Conservation Lands Foundation's "Friends Grassroots Network." Groups in this network have access to grants and funding that can assist them in providing resources to improve visitor experiences on the units.

Section 5: Results and Discussion

5.1: Key Findings

- ✓ Visits to National Monuments and NCAs have grown at over 4x the rate of all BLM recreation sites in the past 10 years
- ✓ Visitors to National Monuments, NCAs and similarly designated units contributed ~~over~~ nearly $460 million in visitor spending, $230 million in labor income, $360 million in value added and over $630 million in economic output to states' economies in 2016. These results are broken down for each state and each unit in 2016.
- ✓ National Monuments and NCAs contributed $17 of economic activity per $1 of funding and over $50 of economic activity per acre, compared with $2.73 per acre of funding
- ✓ Wilderness Areas, WSAs, National Scenic and Historic Trails, and National Wild and Scenic Rivers contributed a significant additional amount in economic activity not included in this analysis. Examples of contributions from these programs include:
  - $11 million in output supported by BLM Wilderness Visits in 2015
  - $2.5 million in output supported by the National Historic Oregon Trail Interpretive Center in 2016
  - $15 million in output supported by the Deschutes Wild and Scenic River in 2016

BLM Revenues from National Monuments and NCAs

- ✓ Red Rock Canyon and Sloan Canyon NCAs in NV brought in over $3 million in revenue for BLM in 2016.
- ✓ Almost $7.8 million in revenue was collected from recreation, lands and realty, range management and other programs in 2016 from the 32 Monuments and NCAs that reported unit collections in BLM's Collections and Billing System.

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5.21: Visitation

Figure 2 shows changes in visitation to National Monuments five years before and after designation. There is an upward trend in visitation over time but in some cases visitation decreases after designation, while in others visitation significantly increases. Decreased visitation may be due to many factors, including changes in the staff in charge of entering visitation data into the RMIS database, or general changes in tourism resulting from economic conditions during the year of designation. Of 20 monuments and NCAs with data available for years before and after designation, 15 experienced increased visitation the year of designation. Given the small sample size and the diversity of units, there is insufficient data to draw a conclusion regarding the "average effect" of a designation.

5.21.1: Impact of Increased Visitation over Time

An additional contribution of National Conservation Lands is the opportunity for economic activity to be generated from tourism for an indefinite period of time. The economic contributions occur annually, and in cases where visitation increases over time, recreation generates additional activity each year that visitation increases. In the past ten years, visitation to all BLM sites has grown at an average rate of about 1.3% (RMIS 2016). Comparatively, during that time, visitation to National Monuments and NCAs that have tracked unit-level visitation since 2005 has grown at an average rate of about 5.4% per year. This represents the sum of all visitations to currently-existing units, including pre-designation years, which means that the increased visitation is not necessarily the result of the addition of new units. This impact does not mean that a designation itself leads to higher growth rates, but rather that designated units conserve recreational opportunities that are seeing faster visitation growth than average BLM sites. This change in visitation can account for significant additional economic activity over time when compared with a site that is not a National Monument or NCA. *

The economic importance of visitation changes is seen when visitor spending is applied to the visitation trends. For example, the average visitor to Dominguez-Escalante National Conservation Area spends $62.97 per visit in the unit's gateway communities. Provided that visitor *characteristics* remain relatively stable at the unit over time, if Dominguez-Escalante NCA follows the average growth pattern for the National Monuments and NCAs program of 5.4%, it can expect an increase of about 5,000 visitors in the next year from its 2016 total of 93,000. Applying the spending average of $62.97 per visit means that total spending in the community can be

National Conservation Lands: Closer than you think!

- ✓ **99%** of cities (259 cities total) of 50,000 or more people in the 12 western BLM states are within just 50 miles of at least one National Conservation Lands unit.
- ✓ **56%** of all units are located within 60 miles of a city of 50,000 or more people
- ✓ **30** large cities of 100,000 or more people have a BLM Wild & Scenic River less than 100 miles away
- ✓ **13** major cities of 500,000 or more people are located within 60 miles of a Scenic or Historic Trail
- ✓ **29** National Monuments, NCAs or similarly designated areas are located within 60 miles of a city of 50,000 or more people

*Note: Due to the openness of BLM's recreation sites, counting visitors is an inexact science. At many units, a combination of vehicle counters, trail registers, and surveys is used to estimate visitor counts. The method for counting visitors may change over time, resulting in a substantial upward or downward adjustment of visit amounts between years. Between 1999 and 2016, there were 607 data points of the annual percentage change in visitation at each monument and NCA designated before 2013. Of these data points, 68 showed that visitation had either doubled or halved between years at a unit. These data points were considered outliers, likely representing a change in estimation methods or new staff on the unit. With the exception of the data visualization in Figures 1 and 2, all average visitation change estimates were calculated under this assumption.

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expected to increase by over $300,000 next year. If visitation continues to grow as it has in the past, that spending amount can be expected to increase year after year. Comparatively, if the unit grew at the average rate for all BLM sites of 1.3%, it would expect an increase of only about 1,200 visitors in the next year. This would amount to a much smaller increase of only $76,000, which is over $220,000 less than the total from assuming its current growth pattern will continue. This is of course just a hypothetical example, since significantly higher growth rates may not necessarily be sustained and fluctuate greatly from year to year, but its purpose is to illustrate the idea that high-growth monuments and NCAs have the *potential* to bring substantial increases in economic opportunity in gateway communities over time.

5.3~~2~~: Economic Contributions

5.3~~2~~.1 National Monuments and NCAs

Many BLM National Monuments and NCAs have multiple entry points and not all have a visitor services station through which most visitors pass. Thus, it is difficult to track visits and even more difficult to know visitor characteristics and spending patterns, upon which economic contributions calculations are based. Several other federal agencies do, however, track visitation. The US Forest Service, Fish and Wildlife Service, and National Park Service each has survey data that is used to prepare economic contributions reports (USFS 2015, Thomas and Koontz 2016, Carver and Caudill 2013). The NPS Visitor Services Project (VSP) provides credible data on visitor characteristics, and many National Conservation Lands units are located with or near a National Park Service site. While National Forests were also considered as potential sites to match with National Conservation Lands, it was deemed that the generic and park-specific profiles for National Parks visitors developed by Thomas and Koontz (2016) could best represent visitors to the National Conservation Lands.

Thomas and Koontz (2016) created four generic visitor characteristic profiles from a set of surveys of visitors to 54 different NPS sites. An NPS site is assumed to fall into one of each of the four categories: parks with lodging, parks with camping inside, historical sites, or recreational areas. Since lodging constitutes the highest individual spending category, parks with lodging are characterized by higher overall spending per visit. BLM National Monuments and NCAs fall into the three non-lodging categories. For this report, National Monuments and NCAs were matched with the *closest* NPS unit in GIS and visitor characteristics from the comparison site were transferred to the unit. For parks that had been surveyed, visitor characteristics from that park's survey were applied, and for units that had not been surveyed, the generic profile that applied to the unit was transferred. In cases where a unit was matched to an NPS site with lodging, the next closest site was selected for comparison. This method provides one standard way of assigning visitor characteristics and spending patterns to BLM National Monuments and NCAs, which have not been surveyed. More details about this methodology are available in Appendix A. A visitor characteristic transfer approach has been used in multiple reports on the economic benefits of other BLM recreation sites, but this is the first study to date to utilize data from the VSP for the National Conservation Lands (Lee, Rempel and Ainsworth 2014, BBC Research 2014, and BLM 2016d).

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Visitor characteristic data, along with spending and overall visitation data was entered into a state IMPLAN model to evaluate the labor income, value added, economic output, and jobs supported by 45 National Monuments and NCAs in the unit's state. This analysis includes all units designated as of November, 2016, but excludes Sand to Snow National Monument in California. Sand to Snow was designated in February 2016 and does not yet have a virtual office in the RMIS database so visitation data for 2016 was not available at the time of this report. The IMPLAN model generated unit-level results, presented below and in a table at the back of this report. The analysis was duplicated for the two years prior to 2016 using the same methodology described above. The prior-year results still include units that were undesignated at that time.

National Monuments, NCAs and Similar Designations Economic Output, 2014-2016

Year	Visits	Employment	Labor Income	Value Added	Output	
2014	7,937,418	6,008	$192,071,679	$306,337,540	$518,097,511	(in $2013)
2015	7,586,062	6,174	$199,098,801	$317,438,461	$540,746,813	(in $2014)
2016	**8,620,554**	**7,133**	**$233,093,932**	**$371,652,309**	**$633,672,379**	(in $2015)

State-level results are also presented below:

Economic Contributions of National Monuments and NCAs, State-by-State Results, 2016

State	Employment	Labor Income	Value Added	Output
AK	20	$649,789	$1,013,465	$1,730,183
AZ	502	$17,204,021	$28,422,102	$47,189,885
CA	972	$38,005,511	$58,542,534	$96,974,850
CO	716	$25,130,877	$41,510,269	$69,360,240
FL	97	$2,980,746	$4,443,253	$7,417,072
ID	156	$3,864,912	$6,147,126	$11,617,480
MT	61	$1,644,963	$2,454,195	$4,653,150
NM	1,206	$32,135,777	$51,903,957	$94,310,194
NV	1,340	$48,490,891	$77,373,811	$123,897,291
OR	794	$23,966,797	$36,308,463	$64,557,956
UT	1,183	$36,148,882	$58,515,201	$105,396,719
WA	85	$2,870,768	$5,017,934	$6,567,359
All	***7,133***	***$233,093,932***	***$371,652,309***	***$633,672,379***

Unit-level results are ~~provided~~ presented below~~in the appendix of this report~~. The unit-level results are to be interpreted as economic contributions to the *state's* economy, based on the spending that occurs within 50 miles of a unit on trip-related purchases. The results also provide an estimation of how incremental increases in visitation can impact local economies. On average, a one visit increase generates around $53.30 in local area spending, and $73.50 in state economic activity. Nonlocal visitors

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who spend the night in the area at a hotel or lodge generate the most money for the state economy, while local day visitors spend the least. The wide range in spending per visitor type underscores the importance of tracking visitor characteristics to each individual unit. An influx of visitors traveling from outside the local area to a unit would represent a larger economic impact than an increase in local day visitors. Even if visitation data were available for before and after a unit designation, the characteristics of the visitors would be an important consideration in determining the economic impact.

Unit	NPS Visitor Profile Used	Total Spending	Employ-ment	Labor Income	Value Added	Output
Steese NCA	North Cascades	$1,340,664	20	$649,789	$1,013,465	$1,730,183
Sonoran Desert	Organ Pipe Cactus	$3,046,196	46	$1,577,959	$2,612,281	$4,335,516
Las Cienegas NCA	Saguaro	$1,680,107	25	$870,312	$1,440,784	$2,391,222
Vermilion Cliffs	Canyon de Chelly	$16,386,713	246	$8,488,479	$14,052,512	$23,322,486
Ironwood Forest	Saguaro	$1,401,970	21	$726,234	$1,202,267	$1,995,362
Agua Fria	Montezuma Castle	$4,408,236	70	$2,344,596	$3,845,477	$6,393,624
Grand Canyon-Parashant	Pipe Spring	$1,802,957	27	$933,950	$1,546,135	$2,566,069
Gila Box Riparian NCA	Chiricahua	$1,489,474	22	$771,562	$1,277,307	$2,119,903
San Pedro Riparian NCA	Coronado	$2,803,196	44	$1,490,928	$2,445,338	$4,065,704
Mojave Trails	Mojave	$9,137,290	144	$5,552,096	$8,513,083	$14,117,516
Berryessa Snow Mountain	Lassen Volcanic	$6,371,835	95	$3,768,188	$5,829,386	$9,643,524
Fort Ord	Pinnacles	$26,180,698	412	$15,908,191	$24,392,183	$40,450,331
Piedras Blancas Historic Light Station ONA	Pinnacles	$369,895	6	$224,759	$344,625	$571,503
Carrizo Plain	Lassen Volcanic	$3,185,917	48	$1,884,094	$2,914,693	$4,821,762
Santa Rosa and San Jacinto Mountains	Joshua Tree	$6,100,756	89	$3,610,577	$5,630,450	$9,308,432
California Coastal	Channel Islands	$2,579,387	39	$1,525,403	$2,359,798	$3,903,802
Headwaters Forest Reserve	Redwood	$2,290,973	34	$1,354,840	$2,095,937	$3,467,299
King Range NCA	Redwood	$7,063,731	105	$4,177,363	$6,462,379	$10,690,681
Browns Canyon	Colorado	$6,835,138	140	$4,894,559	$8,084,655	$13,508,793
Dominguez-Escalante NCA	Colorado	$5,518,891	85	$2,970,844	$4,907,131	$8,199,412
McInnis Canyons NCA	Colorado	$14,512,647	223	$7,812,223	$12,903,946	$21,561,431
Canyons of the Ancients	Hovenweep	$5,321,486	82	$2,864,580	$4,731,609	$7,906,129

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Gunnison Gorge NCA	Black Canyon Of The Gunnison	$12,239,673	188	$6,588,671	$10,882,928	$18,184,475
Jupiter Inlet Lighthouse ONA	Castillo de San Marcos	$6,013,612	97	$2,980,746	$4,443,253	$7,417,072
Craters of the Moon	Craters of the Moon	$117,842	2	$49,136	$78,941	$148,802
Morley Nelson Snake River Birds of Prey NCA	Hagerman Fossil Beds	$8,487,149	154	$3,815,775	$6,068,185	$11,468,678
Pompeys Pillar	Little Bighorn Battlefield	$1,604,480	29	$781,209	$1,167,240	$2,218,923
Upper Missouri River Breaks	Bighorn Canyon	$1,921,052	32	$863,754	$1,286,955	$2,434,227
Organ Mountains-Desert Peaks	White Sands	$19,871,585	306	$8,141,814	$13,018,966	$23,574,571
Rio Grande del Norte	Bandelier	$10,512,042	169	$4,524,959	$7,364,043	$13,389,555
Prehistoric Trackways	White Sands	$1,259,126	19	$515,891	$824,923	$1,493,759
Fort Stanton-Snowy River Cave NCA	White Sands	$1,846,182	28	$756,420	$1,209,535	$2,190,210
Kasha-Katuwe Tent Rocks	Bandelier	$31,351,020	504	$13,495,197	$21,962,454	$39,932,886
El Malpais NCA	El Malpais	$10,570,254	179	$4,701,495	$7,524,037	$13,729,213
Basin and Range	Great Basin	$7,129	0	$3,629	$5,857	$9,335
Sloan Canyon NCA	Lake Mead	$2,869,929	38	$1,379,105	$2,197,814	$3,520,615
Black Rock Desert-High Rock Canyon Emigrant Trails NCA	Lava Beds	$6,647,572	77	$2,864,040	$4,660,396	$7,419,830
Red Rock Canyon NCA	Lake Mead	$92,072,360	1225	$44,244,117	$70,509,743	$112,947,510
Steens Mountain CMPA	John Day Fossil Beds	$10,473,739	171	$5,223,316	$7,858,658	$13,965,946
Cascade-Siskiyou	Redwood	$11,774,944	200	$6,103,752	$9,326,340	$16,572,959
Yaquina Head ONA	Fort Vancouver	$23,706,994	423	$12,639,729	$19,123,465	$34,019,051
Red Cliffs NCA	Cedar Breaks	$8,969,163	152	$4,602,292	$7,421,168	$13,357,546
Beaver Dam Wash NCA	Lake Mead	$402,724	7	$196,995	$311,364	$562,782
Grand Staircase-Escalante	Capitol Reef	$60,637,361	1024	$31,349,595	$50,782,668	$91,476,392
San Juan Islands	San Juan Island	$5,896,600	85	$2,870,768	$5,017,934	$6,567,359
Total		**$459,080,688**	**7133**	**$233,093,932**	**$371,652,309**	**$633,672,379**

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5.~~32~~.2 Wilderness Areas

Modeling the economic contributions of BLM Wilderness visitors is challenging due to a lack of visitation data. There are over 220 Wilderness Areas and over 500 WSAs managed by the BLM, many of which have several different recreation sites in their boundaries. Unlike National Monuments and NCAs, which generally report visitation at the unit-level, Wildernesses and WSAs do not report visitation data as a unit. This means that Wilderness visitation and other economic data must be estimated using a different method than monuments and NCAs. Wilderness Areas are in some ways similar to National Monuments and NCAs, but they have unique management challenges and different capacities for visitors. The difference between Wilderness or WSA visitors and National Monument or NCA visitors is not known.

BLM Wilderness Areas are part of the National Wilderness Preservation System (NWPS). Hjerpe et al (2016) used an IMPLAN model and results for Round 3 of the USFS National Visitor Use Monitoring Survey (NVUM) to calculate the economic contributions of NWPS visitors. By assuming that USFS Wilderness visits, which are tracked by the agency, constitute 80% of all NWPS visits, the study found that NWPS visitors contribute $737 million to the national economy. Since IMPLAN models contributions linearly, an estimate of BLM Wilderness visitor economic contributions can be derived by estimating the proportion of all NWPS visitors who were likely BLM visits. In the model, each visitor is treated to have the same expenditures regardless of the managing agency, so the national contribution of one visitor to NWPS lands is about $74 (note that this amount is based on a national IMPLAN model, which reports a higher output per-visit than a local or state model). Hjerpe et al (2016) assume that NWPS to the NPS, FWS, and BLM all have similar spending patterns as USFS visitors as estimated in Round 3 of the NVUM program. In general, this proves to be a reasonable assumption since BLM pilot studies of NVUM in 2006 and 2009 generated comparable expenditure profiles to those of the USFS (BLM 2009, USFS 2015). Bowker et al (2014) assume that roughly 3% of all NWPS visits are to BLM and FWS Wilderness Areas. The FWS manages 75 Wilderness Areas, ten of which are closed to visitation, while the BLM manages 223. Conservatively, assuming that about half the remaining proportion of all Wilderness visits is to BLM Wilderness Areas, this means that roughly 150,000 visits to BLM Wilderness Areas took place in 2014. Applying the value of $74 in national economic contributions per visit gives an estimated total of $11.1 million in national economic contributions from BLM Wilderness visitors.

Mutual Benefits of Tourism in Southern Oregon

The town of Ashland, Oregon, gateway community to the Cascade-Siskiyou National Monument, boasts one of the most popular Shakespeare theaters in the country. In 2015, nearly 400,000 people from across the world came to Ashland to watch a season of world-class theater. Terry Dickey, chair of Friends of Cascade-Siskiyou National Monument notes that many festival-goers seek additional experiences to go along with their visit and find their way to the National Monument. This is a good example of a "non-primary" visit to Ashland, and a demonstration that monuments can benefit from partnerships with other local attractions.

Many Wilderness Areas are within National Monuments or NCAs. For example, the Paria Canyon-Vermillion Cliffs and Coyote Buttes Wilderness Areas fall within the Vermillion Cliffs National Monument in Arizona and. The Vermillion Cliffs National Monument supports $59.41 in spending per

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visit and $84.55 in economic output supported per visit. Unlike many other BLM Wilderness Areas, the Paria Canyon-Vermillion Cliffs and Coyote Buttes Wilderness Areas track wilderness visits. Of the 275,845 visits to Vermillion Cliffs National Monument, an estimated 41,749 were to the wilderness areas (RMIS 2016). Assuming these wilderness visitors have the same visitor characteristics and spending patterns as other visitors to the monument, $2.48 million in spending, $3.53 million in output and 37 jobs are supported by the wilderness visitors to the monument. The actual economic contributions of these visitors may be more or less than this modeled amount, but this cursory analysis demonstrates that there is overlap between wilderness and monuments. An additional benefit from these areas is their $207,501 in revenue received from permits issued in 2016.

5.3~~2~~.3 National Wild and Scenic Rivers and National Scenic and Historic Trails

The National Wild and Scenic Rivers and National Scenic and Historic Trails systems preserve many high-value cultural and natural resources. The BLM does not track visitation to all rivers and trails, many of which are co-managed with other agencies. Several sites do, however, track river-specific or trail section-specific visitation. Many of these features pass through National Monuments or NCAs, further highlighting the overlapping nature of the many different areas of the National Conservation Lands.

National Historic Trails preserve the routes of some of the most significant cultural routes in American history. In Baker City, Oregon, the National Historic Oregon Trail Interpretive Center (NHOTIC) is one popular site for visitors to see some of the last remaining tracks from the Oregon Trail. Here visitors can learn about the history of westward expansion and take in the same views as the original pioneers saw as they made their journey to start a new life. In 2016, NHOTIC hosted over 35,000 visitors. Applying the same economic contribution analysis as was done for National Monuments and NCAs, this center supported $2.5 million in state economic activity and over 30 jobs in the area.

BLM's National Wild and Scenic Rivers (NWSR) program preserves the free-flowing nature of 69 rivers across the western US. Many of these rivers are either co-managed or have multiple entry points. A visitor might put-in to the river outside of a BLM-managed section, float through and take out past the BLM portion. This makes the accurate counting of river visitation a significant challenge to the BLM. The Deschutes Wild and Scenic River in Oregon hosted 245,126 visits in 2016 for a variety of recreational uses. Applying the same economic contribution analysis methodology as was done for National Monuments and NCAs, this designated river unit supported $15 million in state economic activity and nearly 200 non-federal jobs in Oregon.

Many Wild and Scenic Rivers (WSRs) flow through National Monuments and NCAs. At Upper Missouri River Breaks National Monument (UMRBNM), for example, 16,922 of the monument's 46,342 visits were to the Upper Missouri National Wild and Scenic River. Assuming, as in the wilderness example, that these visitors have similar characteristics to the average monument visitor, then the economic contributions attributable *just* to the WSR visitors can be calculated from the monument's model. This means that of the $1.9 million in spending and the $2.4 million in economic output

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supported at UMRBNM in 2016, $701,400 of spending and $888,900 in output was supported by the WSR visitors.

Due to the overlapping nature of these designations, estimates of the economic contributions from each of the program areas separately may be greater when summed than the contributions to the entire National Conservation Lands.

5.4~~3~~ Economic Value: Nonmarket Values and Ecosystem Services

Many of the values associated with National Conservation Lands are nonmarket values, since most resources are not traded in markets. Nonmarket values include many ecosystem services provided by the National Conservation Lands, though not all ecosystem services are nonmarket values.

5.4~~3~~.1 Nonmarket Values

In addition to the economic contributions of visitors to the National Conservation Lands, the recreational opportunities offered on these lands provide a substantial *value* to the public. These values are captured through site-specific contingent valuation studies and benefit transfers of existing literature. BLM wilderness areas, for example, are a part of National Wilderness Preservation System (NWPS), which includes areas managed by the National Park Service, Fish and Wildlife Service, and Forest Service. Hjerpe et al (2016) estimated that nearly 10 million people visited NWPS lands in 2014, of which 80% were to Forest Service units. A recent synthesis of studies on the economic value of Wilderness suggests that the current use value of wilderness recreation is nearly $84 per visit (Bowker et al 2014). Applying this figure to an estimated 9.9 million visitors in 2014 provides an economic use value of NWPS recreation of about $832 million. Additionally, Bowker et al (2014) estimate that the ecosystem services of climate regulation and waste treatment by the NWPS provided a value of $30 per acre in avoided costs to local communities. This amounts to $3.5 billion annually in value for the entire NWPS (110 million acres) or $262 million of ecosystem service value of BLM Wilderness (8.7 million acres).

Property values are also substantially influenced by the presence of nearby Wilderness. Two studies have been conducted to estimate the change in housing price in response to wilderness designation, both of which show a positive relationship (Phillips 2004, Izon et al 2010). Phillips (2004) finds that residential property values in New England increased 19%, or over $20,000 per acre, by a wilderness designation near a town. Izon et al (2010) found that for each 1% increase in wilderness land per Census tract, housing prices rose between 0.64% and 1.19%. Both studies provide econometric evidence that protected lands positively impact home values, supporting the conclusions of Taylor et al (2012) and Rasker (2012).

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The National Historic Oregon Trail Interpretive Center also provides an important value to visitors, through historical education and interpretation that takes place on the unit. The Recreation Use Values Database, a collection of economic studies that have valued consumers' willingness to pay for different types of outdoor recreation activities, contains 42 individual studies that are categorized as valuing economic value of visits to historic sites. The average value from these 42 studies, which contain nearly 150 individual estimates, is $48 per person, per day. If the average estimated use value were characteristics of NHOTIC, its annual use value would be $1.8 million.

Educational Values of BLM's East Coast Lighthouse

Jupiter Inlet Lighthouse Outstanding Natural Area (JILONA) demonstrates how an urban unit with an active partnership group can help connect a community with the environment. The Loxahatchee River Historical Society, a partner group of JILONA which runs the museum and provides visitor services, put on a first-ever event called Sea Fest for Kids in February 2016. The maritime-themed fun and educational event brought nearly 4000 visitors together to learn about the history of the lighthouse and the marine life of Jupiter Inlet. Fourth graders in attendance all received Every Kid in a Park passes from BLM staff at the event. A lone area of naturalness and preserved history on the Atlantic Coast of Florida, JILONA has a very high educational and cultural value, and popular events like Sea Fest for Kids help to capture that value. Applying a $48 per day use value of a historical site visit from the Recreation Use Values Database implies an economic use benefit of about $190,000 for the one-day event.

Estimating the Economic Use Value of NHOTIC	
a. Average Economic Use Value of a Historic Site Visit*	$48
b. Number of Visits to NHOTIC, 2016	37,777
c. Estimated Economic Use Value of NHOTIC (a x b)	$1,810,000
***source: Recreation Use Values Database. 2016. Corvallis, OR: Oregon State University, College of Forestry. Retrieved Jan 6, 2017 from http://recvaluation.forestry.oregonstate.edu/.**	

Wild and Scenic Rivers also provide important nonmarket values, from offering outstanding recreational opportunities to protecting important riparian areas. Some of the many ecosystem services of rivers include flood prevention, riparian habitat conservation, and water quality. At the Deschutes Wild and Scenic Rivers, recreation visitors realized a significant use value from various types of water-based recreation. Including only visits for river-based recreation, the Deschutes Wild and Scenic River provided $29.8 million of economic use value in 2016. It is important to note that the actual value to visitors to the Deschutes Wild and Scenic River may be higher or lower than this calculated amount. The analysis assumes that visitors to the river assign the same value to recreational experiences at the unit as the average of all surveys of boating and fishing recreation visitors in the Intermountain region of the United States contained in the USGS Benefit Transfer Toolkit (USGS 2016). The analysis also assumes that a separate value exists for both boating and fishing activities on the unit, even though it is likely that some visitors participate in both activities. Since a single visit might entail participation in multiple activities, activity visitor counts are recorded by visitor days (a single visit lasting twelve hours, or multiple visits adding up to twelve hours total for one visitor day) and participants (one person participating in a given activity for an unspecified amount of time). Economic value is recorded in per-

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person per-day amounts and does not specify length of time of activity participation. For this reason, "participant" counts provides a better match for estimating economic use value than visitor days.

Nonmarket Use Value of Deschutes Wild and Scenic River			
Recreation Type	**Participants (*RMIS 2016, report #19*)**	**Per person per day Economic Value (*USGS 2016*)**	**Economic Use Value (*$2015*)**
Boating (Motorized and Nonmotorized)	200,846	$82.79	$16.6 million
Fishing	176,130	$74.84	$13.2 million
		Total	**$29.8 million**

5.~~43~~.~~21~~: Quantifying Ecosystem Services on National Conservation Lands

Ecosystem services are the benefits that ecosystems provide to people, often categorized into provisioning, regulating, habitat, and cultural services. National Conservation Lands provide each of these services in several ways, but the magnitude and scope of the benefits provided by each service varies considerably across different units. For example, Cascade-Siskiyou National Monument in southern Oregon has some of the greatest biodiversity of any area in the country, providing high *habitat service* values. Canyons of the Ancients in Colorado, on the other hand, protects one of the highest densities of cultural sites. Preserving these ancient dwellings and artifacts provides significant cultural service values. Additionally, the BLM's various landscapes- from forested, riparian, sagebrush-steppe to tundra- each provide very different types of values to people.

Executive Memo: Incorporating Ecosystem Services Into Federal Decision Making

Executive Memo M-16-01, released in October 2015, "directs agencies to develop and institutionalize policies to promote consideration of ecosystem services, where appropriate and practicable, in planning, investments, and regulatory contexts…

An ecosystem-services approach can: (1) more completely inform planning and decisions, (2) preserve and enhance the benefits provided by ecosystems to society, (3) reduce the likelihood of unintended consequences, and, (4) where monetization is appropriate and feasible, promote cost efficiencies and increase returns on investment.

An important concept of ecosystem services is that ecosystems can and should be assessed by federal land managers, when feasible, according to Presidential Memorandum M-16-01. Small-scale ecosystem service assessments for Resource Management Plans and associated environmental analyses can provide valuable insights into weighing alternatives. An ecosystem services assessment may begin by identifying the types of services provided by a unit. Appendix B of this report provides a starting point in identifying the ecosystem services provided by the unit. Once identified, any values that are deemed highly important and/or are likely to be impacted by a decision should be researched further for the feasibility of valuation. A zoned socioeconomic specialist with the BLM can provide support in identifying options for conducting an ecosystem services valuation. An example of a valuation technique for endangered species habitat protection is described in the case study of Grand Canyon Parashant National Monument in Section 5.

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Section 6: Unit Example of Assessing the Economic Value of a National Monument or NCA

Grand Canyon Parashant National Monument

(Photo: A BLM Ranger looks onto Grand Canyon-Parashant National Monument, *Bob Wick, BLM*)

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Grand Canyon-Parashant At a Glance	
State	Arizona
Designated	1/11/2000
Acres	1,048,321 (812,581 BLM)
Counties in Planning Area	Mohave County, Arizona. Also includes parts of Coconino (AZ), Washington (UT) and Clark (NV) Counties
Budget (2015)	$1,093,906 (plus $1,616,700 from NPS; $237,581 in project funding)
Visits ('16) Visitor Days ('16)	30,350 18,014
Top five types of recreation visits	1. Driving for pleasure 2. Off-highway vehicle use 3. Camping 4. Hunting-other 5. Hunting-big game
SRPs Issued and Active (2015)	5 issued (all for hunting) 35 active (33 for hunting)
Nearby Major Cities (current est. population)	Las Vegas, NV (600,000) St. George, UT (75,000) Bullhead City, AZ (40,000)
Substitutable Recreation Sites	Grand Canyon NP, Pipe Spring NM, Dixie NF, Zion NP, Valley of Fire SP, Lake Mead NRA, Beaver Dam SP, Kaibab NF, Beaver Dam Wash NCA, Red Cliffs NCA

Key Facts:

- The monument is co-managed by the BLM and National Park Service.
- There are 21 USFS, NPS, and local and state park units within 100 miles of the unit, and six BLM NMs and NCAs.
-The monument is known for its remoteness and vast open space at the intersection of the Sonoran, Mojave, and Great Basin ecosystems.
- GCPNM attracts big game hunters as well as other visitors seeking its outstanding opportunities for solitude and unconfined recreation.

Map of State and Federal Recreation Sites Within 100 Miles of GCPNM

About the Economy of the Grand Canyon-Parashant National Monument Region

Grand Canyon-Parashant National Monument (GCPNM) is located entirely in Mohave County, in northwestern Arizona. The main access point for the monument travels through Washington County in southwestern Utah and Clark County in southern Nevada. Mohave County has a population just over 200,000, and the county seat, Kingman, is located just south of the National Monument. Mohave County has consistently experienced higher rates of unemployment than the state of Arizona, and significantly lower per capita income. Over a quarter ~~¼~~ of the population is over 65, over half claim social security, and 90% is white. Non-labor income makes up over half of all income, and about one fifth of employment is associated with travel and tourism. The county depends greatly on federal land payments for its government revenue. Over half the county is managed by the BLM, and about 45% of all of the BLM's disbursements in the state of Arizona go to Mohave County, mostly from grazing revenues. Compared with the state of Arizona, Mohave County is experiencing greater rates of poverty, unemployment, and non-labor income. The county is also experiencing significantly faster rates of population and personal income growth. (*As reported in Headwaters Economics' Economic Profile System, 2016*)

NATIONAL CONSERVATION LANDS

Regional Economic Contributions of National Monuments and National Conservation Areas

Site Name	Grand Canyon-Parashant
State	AZ
Date of Designation	1/11/2000

Visits (2016)	30,350
15yr Average Annual Visitation Growth	15.83%
15yr Median Annual Visitation Growth	10.53%

Acres	808,747
NPS Comparison Site used for Visitor Characteristics	Pipe Spring

2016 Visitor Spending by Sector

Table 1: Economic Contributions from Visitors to Grand Canyon-Parashant

Average Expenditures per Visit	$59.41
Total Expenditures	$1,802,957
Non-BLM Jobs Supported	27
Labor Income Supported	$933,950
Value Added	$1,546,135
Total Economic Output Supported	$2,566,069

Table 2: Budget, Volunteer Hours, and Revenue

FY15 Budget	$1,093,906
Volunteer Hours (2015)	1,482
Value of Volunteer Contributions	$33,834
FY16 Revenue	$39,698

Table 3: Economic Contributions in Context

Economic output supported per $1 of FY15 budget	$2.35
Economic output supported per acre	$3.17

Table 4: Yearly Economic Contributions	FY 2015 (in $2014)			
	Visits	Total Spending	Jobs Supported	Output Supported
	31,188	$1,783,873	27	$2,515,800

2016 Economic Contributions from Visitor Spending~~: 2016~~

NATIONAL CONSERVATION LANDS

Regional Economic Contributions of National Monuments and National Conservation Areas

Site Name	Grand Canyon-Parashant
State	AZ
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Visits (2016)	30,350
15yr Average Annual Visitation Growth	15.83%
15yr Median Annual Visitation Growth	10.53%

Acres	808,747
USFS Comparison Site	Kaibab NF
NPS Comparison Site	Pipe Spring

2016 Visitor Spending by Sector

Table 1: Economic Contributions from Visitors to Grand Canyon-Parashant

	USFS	Average	NPS
Average Expenditures per Visit	$50.03	$54.72	$59.41
Total Expenditures	$1,518,315	$1,660,636	$1,802,957
Non-BLM Jobs Supported	18	23	27
Labor Income Supported	$612,133	$773,041	$933,950
Value Added	$975,502	$1,260,819	$1,546,135
Total Economic Output Supported	$1,673,916	$2,119,993	$2,566,069

Table 2: Budget, Volunteer Hours, and Revenue

FY15 Budget	$1,093,906
Volunteer Hours (2015)	1,482
Value of Volunteer Contributions	$33,834
FY16 Revenue	$39,698

Table 3: Economic Contributions in Context

Economic output supported per $1 of FY15 budget	$2.35
Economic output supported per acre	$3.17

Table 4: Previous Year Economic Contributions

FY 2014 (in $2013)				FY 2015 (in $2014)			
Visits	Total Spending	Jobs Supported	Output Supported	Visits	Total Spending	Jobs Supported	Output Supported
90,631	$5,183,860	77	$7,001,709	31,188	$1,783,873	27	$2,515,800

Grand Canyon-Parashant's extremely rural and hard-to-reach location keeps its annual visitation low, in 2016, only about 30,000 visits took place. However, it has experienced consistent visitation growth since its designation in 2000, when it had only received about 13,000 annual visits. Despite low visitation compared to other units, the unit contributed an estimated $2.6 million in economic activity to the regional economy. The more than $1.8 million in visitor spending supported 27 jobs in the state in 2016, and the total economic contributions amounted to about $2.35 per dollar of budget and just over $3.17 per acre. A table describing the resources, objects and values of the monument in more detail in the appendix of this report identifies many of the important nonmarket values and ecosystem services associated with this unit.

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Economic Value of Grand Canyon-Parashant National Monument

Nonmarket Values:

As identified in the resources, objects and values described in Proclamation 7265, the executive order establishing the monument, there are many important values associated with GCPNM. See table 1 attached to this reference sheet for a more thorough discussion of these ROV's and their associated economic values. The monument brought 30,350 visits in 2016, most of which occurred on the 810,000 acres managed by the BLM. The monument charges no entrance fees, thus visitors are able to obtain a benefit from their recreational experience without having to pay any money. These experiences provide a value to consumers greater than the $0 they paid, a value described by economists as consumers' willingness to pay. To date, no original study measuring willingness-to-pay for recreation has been conducted on Grand Canyon-Parashant National Monument. There have been, however, many studies conducted in the intermountain region of the United States that have valued the different types of recreation offered at the monument. To estimate the net benefit of recreation opportunities at the monument, the average values of recreation days derived from studies in the intermountain region were used, as reported in the USGS Benefit Transfer Toolkit (USGS 2016). The table below shows the average values used, the number of activity participants in 2016 of each recreation type, and the total economic value, calculated by multiplying the average value by the number of visitor-days spent at that recreation type in 2016. A full listing of the studies used to derive these average values can be found on the interactive USGS Benefit Transfer Toolkit webpage, along with a more detailed description of the methodology and how it may be applied to another recreation site.

Recreation Net Value: $2,417,700

Calculating the Economic Value of Recreation at Grand Canyon-Parashant

Recreation Type	Participants (2016)	Average Value (in $2015)	Total Value
Camping	6,056*	$22.14	$134,100
General Recreation	20,720	$53.51	$1,109,000
Hunting-big game	1,978	$87.17	$174,400
Hunting-other	2,571	$64.98	$167,100
Mountain Biking	606	$196.39	$119,000
Hiking	1,583	$96.08	$152,100
OHV	9,084	$61.87	$562,000
		Total	**$2,417,700**

"Participants" represent one visitor engaging in a particular activity for an unspecified amount of time. One visitor may participate in multiple activities in one day, so the total number of "participants" may be greater than the total number of visits. "Participants" are for 2016 from BLM's RMIS database, report #19. The average values are taken directly from the Benefit Transfer Toolkit's "Average Values" tab for each recreation type in the *Intermountain* region.

**Camping is reported in visitor days, since camping is an overnight activity. One individual on an overnight camping trip, for example, is two days of recreation but is only counted as one participant compared to two visitor days. Visitor days, then, is a more accurate representation of per day camping participation and is used to estimate economic use value from that activity.*

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Ecosystem Services on Grand Canyon-Parashant National Monument

> ***Calculating Economic Value of Habitat Protection***
> a. Number of Households in Mohave County, AZ (US Census 2016): **80,832**
> b. Estimated willingness-to-pay for desert bighorn sheep habitat protection (King et al 1988): **$20.27 - $36.37** per household per year ($2015)
> c. Total economic value of desert bighorn sheep habitat protection in GCPNM (a x b): **$1,638,000 - $2,940,000** per year

Supporting Service: *Habitat protection for desert bighorn sheep*
Net Value: between $1,638,000 and $2,940,000 per year for residents of Mohave County, AZ
GCPNM protects habitat for the threatened desert tortoise, as well as several species of birds and bats. It also protects habitat for a small herd of desert bighorn sheep. A 1985 study by King et al surveyed households in Tucson, AZ to assess willingness to pay to preserve habitat for a herd of desert bighorn sheep located less than 10 miles from the city. Using a contingent valuation survey and a sample of over 500 Tucson residents found that average willingness to pay to protect and restore habitat for a herd of 70 sheep facing habitat loss was between $20.27 and $36.37 per household per year (adjusted to 2015 dollars). The low value assumes that those households that did not respond to the survey place a value of $0 on the desert bighorn sheep habitat, while the high value assumes that non-respondents place the same value on the species habitat as the median respondent in the survey.

To place a value on the benefits provided to people by the conservation of desert bighorn sheep habitat, this per-household per-year value must be multiplied by the number of households that would be represented by the survey sample in King et al (1988). There at least four large herds of desert bighorn sheep in the Arizona strip district whose population together totaled 550 on BLM-managed lands in 1996 (BLM 2016b). Assuming that the herd on and near GCPNM is of comparable value to residents of Mohave County means that the value estimates of per-household per-year willingness-to-pay can be multiplied by the 80,832 households gives a conservative estimate of a total economic value for desert bighorn sheep of between $1,638,000 and $2,940,000 per year in $2015.

Other people outside Mohave County, Arizona may also place a benefit on bighorn sheep habitat in the area, but these values are not included in this analysis. It is also possible that protection of habitat for other wildlife in the area overlaps with values for desert bighorn sheep habitat. For example, Loomis and Eckstrand (1997) found that habitat protection for the Mexican spotted owl was worth 83% of the value of protecting a total of 62 threatened and endangered species. The desert bighorn sheep may share a similar relationship with other species in the area.

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