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**From:** Bailey, Cathi  
**Sent:** 2017-01-27T18:42:40-05:00  
**Importance:** Normal  
**Subject:** Re: Requesting your feedback: Economic Report for National Conservation Lands  
**Received:** 2017-01-27T18:43:31-05:00  
[Economic Report DRAFT 1 18 cbailey01-27-17.docx](#)

Hi Egan,

Thanks so much for your work on this report. This report will be very helpful. I know that the focus is mostly on NMs and NCAs, but as we discussed, if you could add a bit more on WSRs, that would be great. My comments and edits are in track change within the attached version.

Thanks!  
Cathi

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On Wed, Jan 18, 2017 at 10:13 AM, Cornachione, Egan <[ecornachione@blm.gov](mailto:ecornachione@blm.gov)> wrote:

Hi All,

Attached is a draft of my economic report for the National Conservation Lands that I am requesting your feedback on. We plan on sharing this report and my findings with an internal and external audience, for communications purposes and as a resource/reference.

Please take a look and provide any comments **no later than Friday, 1/27**. Note that it is not ready for distribution and should not be shared. Please call or email if you have any questions!

Thanks for the help and feedback with this project!

Egan

--

**Egan Cornachione**

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National Conservation Lands

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**Economic Report:** National Conservation Lands

January 2017

## An Analysis of the Economic Effects of the National Conservation Lands



(Visitors on a Scooter Tour of Red Rock Canyon National Conservation Area, photo by Bob Wick, BLM)

January 18, 2017

Prepared by Egan Cornachione, GeoCorps Intern with the National Conservation Lands

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

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### Executive Summary

This report addresses two important questions about the Bureau of Land Management's (BLM) National Conservation Lands. First, what are the economic values associated with the National Conservation Lands and how can they be measured? Second, what are the economic impacts of a National Monument or National Conservation Area (NCA) designation? To address these questions, this report:

- Defines important economic terms and concepts related to National Conservation Lands. This includes clarifying the distinction between economic value, economic contributions, and economic impacts; defining ecosystem services; and explaining a total economic value framework, including direct, indirect, and non use values, and both market and nonmarket values.
- Provides a framework for analyzing the economic value of a unit based on the resources, objects, and values for which the unit is designated.
- Describes a format for understanding what impact a National Monument designation *may* have on a community economy. The economic impact of a monument designation depends on a number of factors and may be positive or negative and short or long lasting based on these factors.
- Measures the economic contributions of National Conservation Lands. Visitors to National Monuments, National Conservation Areas (NCAs), and similarly designated units spent over \$425 million on purchases related to their trips within 50 miles of a unit. This contributed an estimated \$600 million in economic activity, 6,000 jobs, and \$260 million in incomes to state economies.
- Analyzes 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 less than 1.3% per year. This is evidence that, on average, visitation growth to National Monuments, NCAs and similarly designated units is sustained at a level above that of regular BLM sites, generating additional economic contributions from visitation for multiple years after designation.
- Quantifies one ecosystem service provided by National Conservation Lands: carbon sequestration. Based on USGS data, National Conservation Lands sequestered an estimated 3.4 million metric tons of CO<sub>2</sub> in 2015. If the most recent value of the social cost of carbon is applied, this service is valued at nearly \$140 million of global benefit in 2015.
- Introduces the concept of nonmarket value and describes methods for measuring nonmarket values associated with recreation on National Conservation Lands sites.
- Demonstrates how the statistics, economic concepts and framework provided in this report can be applied to an individual unit. Grand Canyon Parashant National Monument is utilized as a case study.
- Provides examples to illustrate the theories and data sources that can be used for future analyses.

**Commented [BCM2]:** It would be great to see this answered in more detail for the other unit types (WSRs, Trails, W/WSAs). What data do we need to answer these questions for the other unit types?

- **\$600 Million:** economic contributions of visitors to National Monuments and NCAs in 2016
- **4x:** the amount by which visitation growth to National Monuments and NCAs exceeds that of all BLM sites
- **6,000:** the amount of jobs supported by National Monument and NCA visitors in 2016
- **\$140 million:** estimated value of the 3.4 million tons of CO<sub>2</sub> sequestered by National Conservation Lands in 2015

### Section 1: Introduction

This report is meant to address two important questions about the Bureau of Land Management's (BLM) National Conservation Lands. First, what are the economic values associated with the National Conservation Lands and how can they be measured? Second, what are the economic impacts of a National Monument or National Conservation Area (NCA) designation? These two questions are of special interest to a variety of stakeholders including the BLM, federal decision makers, local communities, and the general public. This report and the statistics generated from it are intended to be used as a resource for all with an interest in the National Conservation Lands, internal or external to BLM.

The National Conservation Lands are a system of 876 federally recognized units, comprising nearly 36 million acres. They include 27 National Monuments like the newly designated Bear's Ears National Monument; 21 NCAs and similarly designated units such as Yaquina Head Outstanding Natural Area; 223 Wilderness Areas such as the extraordinary 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.

This report focuses particularly on National Monuments and NCAs, but the fundamental economic concepts are applicable, with proper consideration, to rivers, trails, wilderness areas, and wilderness study areas. National Monuments and NCAs are designated either by Congress or the President to conserve culturally important resources, objects and values for the benefit of current and future generations. This report addresses how these resources, objects and values can be utilized as a simple framework for analyzing the economic value of units when linked with a few important concepts from environmental economics.

Designating a National Monument or NCA prioritizes conservation on these lands. Typically, oil drilling, coal mining and other forms of resource extraction are withdrawn once an area is designated as a National Monument or NCA, however, valid existing rights are honored and other activities that are compatible with the designation are allowed. This means that several of the most recognizable sources of economic values associated with BLM 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 recreation 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, for example, has gone from hosting just over a half million visits in 2000 to nearly a million visits in 2016. As nationally treasured landscapes, these designations 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 units 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. Home values, water bills, frequency of natural disasters, and local crop productivity can all be linked directly or indirectly to the presence of protected public lands (Taylor et al 2012, Gosnell and Abrams 2011, Ricketts et al 2008 and Rasker 2102).

This report is intended to be used by many different stakeholders and for several different purposes. Specific to BLM, the information may be useful for planners working on socioeconomic

Commented [BCM3]: Should also include natural and scenic resources too.

analyses of projects relating to National Monuments and NCAs. The results section provides statistics that can be used to communicate the economic value and contributions of National Conservation Lands. The definitions, explanations, and examples of various economic concepts contained within this report are intended to aid non specialists, internal or external to the BLM, in understanding economic terms and concepts related to National Conservation Lands. Finally, the framework for evaluating the economic effects of a new designation may be used to help inform decisions relating to new monuments or NCAs, as well as to provide resources to gateway communities.

## Section 2: Economic Concepts of the National Conservation Lands

### 2.1: Defining Economic Value and Economic Impact

When doing an economic analysis, it is important to draw a clear distinction between economic values, economic contributions, and economic impacts. The first question of this report addresses economic *value*. Economic value, which can sometimes be called economic benefit, is essentially a measure of what a good or service is worth to people. In the case of National Conservation Lands, their economic value is measured by the benefits people gain from the services these lands provide. Economic *contributions* are a measure of the economic activity in a region associated with a particular industry or business. Economic activity is the production, distribution, and consumption of goods and services in an area. An economic impact study evaluates *changes* in economic activity as a result of an action. When calculating the economic impacts of National Conservation Lands, the changes in local gateway communities' economic activity is estimated. The first section of this report describes the important concepts of economic value, and provides a framework for understanding all components of the economic value of National Conservation Lands units. Economic contributions can fit into a discussion of economic value but they are, quantitatively, measuring two different things.

#### Defining Economic Terms:

*Value:* how much a good or service is worth.

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

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

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

### 2.2: Types of Economic Values

Economic values can be characterized several different ways. Some values are associated with uses of the land, while others are associated with *non* use. 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 indirect use, direct use and non use values. As shown in Figure 1, total economic value is measured as the sum of all of these values.

Economic values are also characterized by *how* they are valued. Some values, such as resource values of oil or other minerals, can be estimated from market data about the buying and selling patterns of the commodity. However, many values associated with conservation, such as habitat protection, are not directly captured in market activity. These nonmarket values are not bought and sold, and must be measured indirectly by methods such as looking at the market for related goods, or by creating a

hypothetical market in which to observe choices. Nonmarket values constitute a significant portion of the values associated with National Monuments.

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

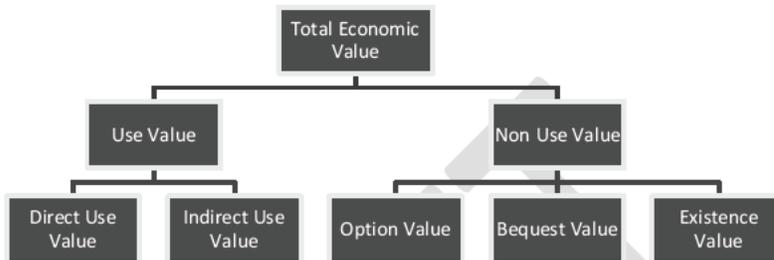


Table 1: Defining Use vs. Non-Use Values and Market vs. Nonmarket Values

<b>Direct Use Value</b>	Direct use values are captured through peoples' uses of resources provided by the land and include the values placed on recreation, mineral extraction and water withdrawal.
<b>Indirect Use Value</b>	Indirect use values include benefits to people that are passively consumed. For example, through National Conservation Lands' management practices, viewsheds are preserved and healthy air and water are maintained. Indirect use values occur when people reap the benefits provided by conserved resources without directly using them.
<b>Non-Use Value</b>	Non use values are benefits derived without using the resource. They are peoples' willingness to pay for the intangible benefits provided by the conservation of landscapes and resources they protect. There are three main categories of non use values:  <i>Existence Value:</i> valuing the continued existence of a species or landmark even without the intention to visit. <i>Option Value:</i> valuing a resource in order to have the option of using it at some point in the future. <i>Bequest Value:</i> valuing the continued existence of a resource for use by future generations.
<b>Market Values</b>	Markets allow for the buying and selling of goods at established prices. Values of market goods can be estimated by observing and analyzing these market decisions. A good or service provided by National Conservation Lands that is directly traded in a market can be valued based on the market activity.
<b>Nonmarket Values</b>	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 value ascribed to recreational experiences such as fishing, hiking or camping are examples of nonmarket values. The public places a value on these resources or activities, but they are not usually sold or purchased. These values can be measured or explained both

quantitatively and qualitatively in an economic analysis.

### 2.3 Nonmarket Values

BLM Instruction Memorandum 2013 131 provides administrative guidance on the integration of nonmarket values into planning processes. Although nonmarket values are difficult to measure and at times less digestible for non specialists, the guidance states that NEPA analyses must include consideration of nonmarket values. 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, if any are met, warrant a quantitative nonmarket valuation.

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."*

In the case of a National Monument or NCA, the designation often imposes restrictions on the types of future allowable uses on the monument. Under criterion number two, and in some cases numbers one and three as well, a monument designation should require nonmarket valuation. Conversely, a project that interferes with the resource values of a designated unit of the National Conservation Lands will likely necessitate nonmarket valuation under the first criterion. Appendix B demonstrates the use of this concept to place a dollar value on recreational experiences.

**Commented [BCM4]:** Thanks for providing this information and describing the linkage to planning. This will be helpful to point to in this report. I don't think we use the direction in this IM in our RMPs very much.

2.4 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. This concept bridges the historical divide created between the economy and the environment by identifying the ways in which the environment and economy are linked. Not all values related to National Conservation Lands are ecosystem services, but many are. These values are often classified into four categories (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 supports the BLM's multiple use and sustained yield mission and creates a need to adequately quantify 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). In the future, the BLM will publish guidance for estimating 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 the case of National Monuments and NCAs, the resources, objects and values for which the unit is designated are a useful guideline for understanding ecosystem services at the unit level.

Commented [BCM5]: Great to hear.

Commented [BCM6]: Suggest rewording this sentence to cover all National Conservation Lands unit types. For example: "In the case of National Conservation Lands, the special values, resources, objects, and settings for which each unit is designated are a useful guideline for understanding ecosystem services at the unit level."

2.5 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 designated unit. In a contribution analysis, an input output (IO) model generates a simulated economy that tracks the linkages between different sectors of an economy. IO models track the flow of goods and services from their production to their sale. Take, for example, \$100 spent at a local restaurant as part of a monument visit. Perhaps of that \$100, forty dollars goes to purchase ingredients in the local region, thirty goes towards rent and building maintenance and thirty goes towards wages and profit. All \$100 of visitor spending is a direct

effect since it is money that stays within the region. Looking specifically at the forty dollars going towards ingredients, those businesses that sell ingredients to the restaurant will experience an increase in activity and they, too, will spend that money on their various inputs. These are called indirect effects. In the case of the thirty dollars 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.

For this report, IMPLAN (Impact Analysis for PLANNing), a widely used input output modeling software, is used to estimate regional economic contributions. IMPLAN 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:

*Jobs:* the annual average of monthly jobs, both part time and full time. One part or full time job lasting twelve months is equivalent to two part or full time jobs lasting six months. An important note is that unless a true impact analysis is being run, these are not necessarily jobs created by the unit. IMPLAN reports the number of jobs that are supported by visitor spending, but likely some jobs would still exist without tourism generated from the monument. 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 separate from jobs supported as measured in an IMPLAN analysis.

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

*Value Added:* the difference between the sale price of all goods sold and the production value of the goods. In other words, if consumers spent \$100 on souvenirs that cost \$40 to make and sell (including cost of materials and other costs of operations), then \$60 of value is added to the economy upon the item’s sale.

*Output:* the sum of all direct, indirect, and induced spending in the region. Output represents all economic activity supported by the dollars visitors spend in the region on their trip.

### **Section 3: Putting it Together: A Framework for Analyzing the Economic Value of National Monuments and National Conservation Areas**

#### **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. Despite all units being *open* for recreation, 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 since they are *worth* something to people. Take cultural resources, for example. There is a direct use value obtained by visitors who place a value on the opportunity of getting to see, touch, or experience a preserved cultural site. Additionally,

local residents 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. Residents place a value on a strong community and maintaining cultural ties, and this value may be increased by the access to a preserved cultural site. Additionally, people who live far away from the site but who value it will likely benefit from knowing it is preserved (non use value).

Table C2, in Appendix C of this report, provides a framework for identifying, describing and calculating 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 identified when a decision warrants nonmarket valuation. In planning or project assessments a qualitative description of the values is recommended when no quantitative data is available (BLM IM 2013 131). [The framework in Table 3] provides a list of valuation ideas and techniques that, while not exhaustive, can serve as a guideline when conducting an economic analysis. Most valuation techniques require the support of a trained economist, but when an economist is not available, this table can aid a non specialist in identifying and describing economic values of a unit and quantifying effects where possible. See section 5 and *Featured Unit: Grand Staircase Escalante National Monument* for an example of how some of these values can be monetized, and appendices A and B for methodologies of a few of the valuation techniques listed.

**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 that is affected by a designation. A strong, diverse, and stable economy is of value to a local community and public lands are connected to this value. Although this value is also not

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

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

Commented [BCM7]: I don't see a "Table 3."

**Economic Report: National Conservation Lands**

January 2017

***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. As an example, Red Rocks 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.

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 economic activities taking place on the unit do not represent an economic value but they are useful in understanding the value. If many jobs are supported by monument visitation in a relatively small local economy, then it is likely that 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 (Table 10). The continued or sustained economic activity generated as a result of this visitation supports economic *stability*.

**3.3: Three Factors to Consider with Economic Effects**

Economic value can vary by space, time, and group. Any statistics or values generated from an economic analysis should be described in terms of these dimensions. 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

***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. Bowker et al (2014) cite research by Black (1996) to value a published article as providing \$15,800 of benefit to society annually. This suggests these articles provide an annual value of over \$7.5 million (\$2015). (\$15,800x500 articles)

***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 for farms in 2010 (Calderone 2012).

value associated with protecting an endangered species might be global. The decision context will determine if and how these values should be considered.

#### Section 4: Assessing the Impact of a National Monument or NCA Designation

##### 4.1: Background on the Economic Impact of Protected Land Designations

The second important question that this report addresses regards the impact a designation has on economic activity. Since 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 occur is important. Much of the economic impact is seen from increased visitation after the designation of a National Monument or NCA. The naming of a designation has a great effect on its 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 converted to National Parks, controlling for other factors that might impact visitation. Although National Parks and BLM National Monuments are not directly comparable, this study provides peer reviewed evidence that the naming of a designation is important, and visitation is likely to increase in response to a more recognizable monument naming. The increased visitation from a designation brings increased visitor spending and generates additional economic activity in the region.

The literature also cites several other examples besides tourism of how a National Monument or other protected 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:** evidence shows that home values are greater nearer to protected public lands, all other things 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 service, and arts, entertainment, and recreation.

To be clear, the literature shows that these impacts 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,

##### **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.

##### **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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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 represent the contrast in visitation between 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 rural areas, while others are just miles from some of the largest cities in the west. Given the BLM’s wide variety of unit types, locations and recreation opportunities, it is impractical to make generalizations about the economic impact a designation can have on a community. While there is evidence that National Monuments and NCAs can positively impact local economies after designation, the likelihood and magnitude of these impacts depends on many different factors.

**4.2: Factors Influencing the Economic Impact of a National Monument or NCA Designation**

The best way to address the question of the economic impact of a monument designation is through the lens of the factors that are most likely influence visitation to the unit. A National Monument designation provides name recognition that is likely to have a positive 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 their 6% annual growth rate of visitation, National Monuments are increasingly becoming popular tourist destinations for visitors from both inside and outside the United States. The outstanding recreation opportunities provided by these BLM sites attract millions of visitors annually, but visitation depends on a number of important factors. Understanding these factors provides a basis for evaluating how a monument designation will affect visitor use and interest in the unit. Table 4 lists the factors that, based on literature, quantitative data, and anecdotal evidence, are likely to influence visitation to a unit. These factors should be evaluated when understanding the short and long run impacts that can be anticipated from a newly designated unit.

**Table 5: Factors Influencing Unit Visitation**

**Commented [BCMB]:** is there a Table 3 and a Table 4?

<p><b>Type of amenities offered at the unit</b></p>	<p>The type of recreation a unit offers influences the degree to which it attracts visitors. As reflected in consumers’ willingness to pay for various activities, certain recreation opportunities are “worth” more to people than others. For example, the average consumer surplus of a recreation day of fishing is \$75, while that of camping is only \$22 (USGS 2016). Based on this relationship, more valued opportunities are likely to attract greater amounts of visitors. 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 among items the managing agency has some influence over, the offerings of 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 Monument and NCA 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.</p>
<p><b>Urban / Rural location</b></p>	<p>Proximity to urban areas is important, as most visitors to BLM lands travel less than 50 miles from home to reach their recreation site (White nd). Based on the 2006 and 2009 BLM National Visitor Use Monitoring Process Pilot Studies, about half of all visitors surveyed traveled less than 50 miles to get to their BLM recreation site. In four out of six units surveyed, the amount of visitors traveling less than 50 miles to the site was over 70% (White nd). Non local visitors spend the most money on their visits, although locals still generate economic activity on their trip related expenditures (Table 7). 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).</p>

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<b>Population served</b>	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). Units that provide more access to individuals falling into these categories will likely experience greater increases in visitation.
<b>Resources, Objects, and Values of Designation</b>	The resources, objects and values of a designation establish management objectives for the unit. Some resources are more popular for visitors. As a hypothetical example, an area with high riparian values may bring in a large quantity of fishermen, while an area with high vegetative values may comparatively attract fewer people if there is a lower demand for use or enjoyment of that resource. Additionally, Wilderness Areas within a Monument are protected for their naturalness, and are by their designation roadless areas (Wilderness Act of 1964). A lack of development helps protect the wilderness qualities and conserve the resources, objects and values of a Monument, but it can also hinder visitation growth by limiting access.
<b>Ease of access/ transportation</b>	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. A connected county was defined as having a population center within one hour commuting distance of the nearest airport with daily passenger service, while an isolated county is a rural county that is further than a one hour drive to the nearest airport. As a result of this relationship, units that are more easily accessible either from roads or major airports are likely to experience greater visitation. This is an important factor to consider when analyzing the potential effects of a monument designation. If the unit is accessible by a major highway and connected to large population centers by an airport, it is more likely to experience greater visitation effects than a similar unit that is less connected.
<b>Substitutable recreation sites</b>	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. People were comparatively less willing to travel greater distances to travel to a substitute destination. A park 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 often attract visitors who spend time at multiple units. In this way, 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.
<b>Local partnerships, knowledge, and activism</b>	Active partnerships with local organizations are highly important in garnering public interest and visitation to monuments. As illustrated in Ex 3, in Las Cruces, New Mexico, 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 help to attract visitors. Monuments and NCAs with these partnerships are likely to be more capable of attracting visitors. Many monuments and NCAs have partner groups included in the Conservation Lands Foundation “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.

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## Section 5: Results and Discussion

### 5.1: Key Findings

- ✓ Visitors to National Monuments, NCAs and similarly designated units contributed over \$425 million in visitor spending, \$260 million in labor income, \$350 million in value added and over \$600 million in economic output in states in 2016.
- ✓ National Monuments and NCAs contributed \$16 of economic activity per \$1 of funding and over \$44 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:
  - \$11.1 million in output supported by BLM Wilderness Visits
  - \$2.5 million in output supported by the National Historic Oregon Trail Interpretive Center
  - \$15 million in output supported by the Deschutes Wild and Scenic River
- ✓ Visits to National Monuments and NCAs have grown at over 4x the rate of all BLM recreation sites in the past 10 years.
- ✓ National Conservation Lands units sequestered an estimated 3.4 million metric tons of carbon dioxide in 2015, at an estimated benefit of \$140 million

#### *Revenues from National Monuments and NCAs*

- ✓ Red Rock Canyon and Sloan Canyon NCAs together brought in over \$3 million in revenue in 2016.
- ✓ Almost \$7.8 million in revenue was collected in 2016 from the 32 Monuments and NCAs that reported unit collections in BLM's Collections and Billing System.

### 5.2: Economic Contributions

Visitors to National Monuments and NCAs in 2016 spent an estimated \$425 million on trip related purchases. This spending supported approximately 6,000 jobs, \$260 million in labor income, \$400 million in value added, and \$600 million in economic output. \* Put in context, for every dollar National Monuments and NCAs were allocated in budget, \$16 was supported in regional economic output and \$7 in labor income was supported. About \$6,140 federal dollars were spent per job supported. Per acre of land managed, the Monuments and NCAs program of BLM generated \$44 in economic contributions, on a budget of only \$2.73 of funding per acre

System wide, unit by unit, and state by state results of the economic contribution analysis are displayed in Tables 5 through 7 (Tables Forthcoming). These results represent the economic activity supported in states by visitors' spending within 50 miles of BLM National Monuments and NCAs as a result of visitor expenditures. Nevada experienced the greatest contributions from National Monument and NCA visitation, followed by New Mexico and Utah.

Tables 8 through 10 put the results into further context. Visitors spent the most on gas and oil (\$102 million), followed by groceries (\$71 million) and restaurants (\$66 million) (Table 7). Of all visitor types, non local overnight visitors spent the most money, an average of \$146 per person per visit (Table

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**Accessibility of National Conservation Lands**

- ✓ 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 (including parts of Rivers and Trails). The number only drops to 88% of all cities if Rivers and Trail features are excluded.
- ✓ About two thirds (66%) of all 876 units are located within 100 miles of a city of 10,000 or more people
- ✓ Over half (56%) of all units are located within 60 miles of a city of 50,000 or more people
- ✓ 30 large cities (populations greater than 100,000) have a BLM Wild & Scenic River less than 100 miles away
- ✓ 13 major cities of 500,000 or more people located within 60 miles of a Scenic or Historic Trail
- ✓ 29 of 46 National Monuments, NCAs or similarly designated areas are located within 60 miles of a city of 50,000 or more people

8). Non local visitor spending also represents out of town dollars entering the economy as a result of the monument or NCA. While local dollars would likely be spent elsewhere in the community if the unit were not there, non local dollars spent on primary purpose visits may not have otherwise entered the local economy if not for the unit. Non local visitor spending comprised over 75% of all National Monument and NCA visitor spending in 2016.

The results also provide an estimation of how incremental increases in visitation can impact local economies. A one visit increase generates between \$X and \$X in local area spending, and \$X and \$X in local economic activity. An increase of X visitors will provide an additional job in the region (fill in when calculated).

It is important to note that these are estimates based on the best available data to the BLM. Many BLM

recreation sites lack visitor counting stations and they often have multiple entry points. Thus, it is difficult to track visitors and even more difficult to know the visitor characteristics and spending patterns, upon which economic contributions calculations are based. The USFS NVUM program and the NPS Visitor Services Project provide credible data on visitor characteristics, however, and many National Conservation Lands units are located on or near either a National Forest or National Park Service site. While not identical, many NPS and USFS units provide *similar* forms of recreation and serve similar demographics. By matching monuments and NCAs with the closest USFS and NPS unit comparison and transferring visitor characteristics, a close approximation is made to the actual visitor characteristics at each particular National Conservation Lands unit. A similar approach has been used in multiple reports on the economic benefits of other BLM recreation sites (Lee, Rempel and Ainsworth 2014, BBC Research 2014, and BLM 2016d).

**5.3: Trends in Visitation**

Figure 2 shows changes in visitation to National Monuments five years before and after designation. There is a general upward trend in visitation over time but in some cases visitation decreases after designation, while in others visitation significantly increases. Of the

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**Getting the Most of the Organ Mountains-Desert Peaks National Monument Designation**

In September 2016, the city of Las Cruces, New Mexico, hosted a month long series of events called Monuments to Main Street to showcase its three National Monuments. All month long, the city hosted local food, drink, music and cultural festivals interspersed with activities that brought visitors and locals onto the grounds of their area's National Monuments. The monument events included three separate tours of Organ Mountains Desert Peaks and Prehistoric Trackways National Monuments, as well as a health and wellness event in OMDP and an aerial tour over a WWII historical site near the monument. Events like these, organized by the Las Cruces Convention and Visitors Bureau, highlight the ways in which an active community can generate positive economic benefits from National Monuments. A recent report from Tourism Economics showed that 6000 jobs in Dona Ana County are supported by tourism, and visitor spending from tourism in the county and the state has been steadily increasing in the past five years.

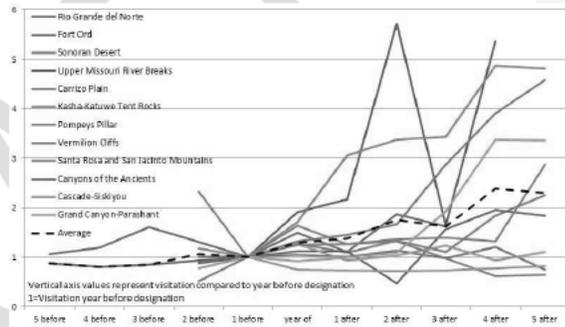
22 monuments and NCAs with data available for years after designation, thirteen saw visitation increases in the year following designation. The greatest jump in visitation was seen between the year before designation and the year after, as 15 of the 20 monuments and NCAs with data available before designation experienced increased visitation the year of designation. This suggests that units experience a jump in visitation the year of being designated, but the effects are not necessarily long lasting. These graphics support the conclusion that visitation depends on a number of factors as described in Table 4, and visitation may change over time in response to any of these factors.

5.3.1: Impact of Increased Visitation over Time

One of the other most significant benefits of a National Monument or NCA designation is that visitation to these sites tends to increase at a greater rate than other BLM units. Visitation to all BLM sites has grown at an average rate of about 1.3% per year since 2005 (RMIS 2016). Comparatively, visitation to National Monuments and NCAs that have tracked visitation since 2005 has grown at an average rate of about 5.4% per year. This change in visitation can account for significant additional economic impacts over time from a designation. \*

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, if the unit 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 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, 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.

Figure 2: Visitation to National Monuments Before and After Designation (RMIS 2016)



\*These amounts were calculated using an IMPLAN model based on visitor data from BLM's Recreation Management Information System (RMIS), the US Forest Service National Visitor Use Monitoring Program (NVUM), the National Park Service Visitor Services Project (VSP) and a BLM NVUM pilot program from 2006 and 2007. PRELIMINARY DRAFT FOR DISTRIBUTION (Draft) 17

#### 5.4: Wilderness Areas and Wilderness Study Areas (WSAs)

Tracking the use value or 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. 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. They experience less out of town visitation and per visitor spending is typically lower than at National Monuments (Holmes et al 2016, Hjerpe et al 2016).

BLM Wilderness Areas are a part of the larger 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).

##### *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.

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 Wilderness visitors. Assuming that USFS Wilderness visits 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 contribution of one visitor to NWPS lands is about \$74. Hjerpe et al (2016) assume that NWPS to the NPS, FWS, and BLM all

\*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.

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 very similar expenditure profiles as 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. It is likely that this rough estimate is an under approximation of the actual contributions of BLM Wilderness visitors.

**Table 11: Wilderness Economic Values and Contributions**

<b>Value of a Wilderness Visitor Use Day</b>	<b>\$84</b> of use value per visit (Bowker et al 2014)
<b>Average Economic Contribution per Wilderness Visit</b>	<b>\$74</b> of economic contributions per visit (Hjerpe et al 2016)
<b>Estimated Visitation to National Wilderness Preservation System (NWPS) 2014</b>	<b>9.9 million</b> estimated visits (Hjerpe et al 2016)
<b>Projected Visitation to BLM Wilderness, 2014</b>	<b>150,000</b> estimated visits (Derived from Hjerpe et al 2016)
<b>Projected Use Value of BLM Wilderness Visits</b>	<b>\$12.6 million</b> (derived from Bowker et al 2014 and Hjerpe et al 2016)
<b>Projected Economic Contribution of BLM Wilderness Visitors, 2014</b>	<b>\$11.1 million</b> of economic output (derived from Hjerpe et al 2016)

Finally, property values are 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 in the vicinity, 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 strong econometric evidence that protected lands positively impact home values, supporting the conclusions of Taylor et al (2012) and Rasker (2012).

**5.5: National Wild and Scenic Rivers and National Scenic and Historic Trails**

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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.

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 local economic activity and over 30 jobs in the area.

Additional benefits of this site include the nonmarket value of the historical education and interpretation that takes place here. 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 for valuing consumer surplus of visits to historic sites. The average value from these 42 studies, which contain nearly 150 individual estimates, is \$48 per person, per day. This implies that the annual use value of NHOTIC is \$1.8 million.

Estimating the Economic Use Value of NHOTIC	
a. Average Use Value of a Historic Site Visit*	\$48
b. Number of Visits to NHOTIC, 2016	37,777
c. Estimated Use Value of NHOTIC (a x b)	\$1,800,000
*source: Recreation Use Values Database. 2016. Corvallis, OR: Oregon State University, College of Forestry. Retrieved Jan 6, 2017 from <a href="http://recvaluation.forestry.oregonstate.edu/">http://recvaluation.forestry.oregonstate.edu/</a> .	

BLM's National Wild and Scenic Rivers program protects and enhances the free flowing nature, water quality, and outstandingly remarkable values of 69 rivers across the western US. Some 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. Since not all rivers have visitation data available, only one example of the National Wild and Scenic Rivers Program's economic effects is provided in this paper. For rivers where visitation data is tracked and reported, it is feasible to estimate the economic contributions of visitors. 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 local economic activity and nearly 200 non federal jobs in the region. Additional benefits from this river's protection include flood prevention, riparian habitat conservation, and water quality. Its river

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**Commented [BCM11]:** How do you figure this? From protection of the habitat/banks; reduced or no development?

recreation visitors also realized a significant use value from various types of water based recreation. Including only these water recreation benefits, Deschutes Wild and Scenic River provided \$17.3 million of economic use value in 2016.

Economic Use Value of Deschutes Wild and Scenic River			
Recreation Type	Visitor Use Days (RMIS 2016)	Per person per day Consumer Surplus (USGS 2016)	Economic Use Value (\$2015)
Boating (Motorized and Nonmotorized)	122,135	\$82.79	\$10.1 million
Fishing	95,699	\$74.84	\$7.2 million
<b>Total</b>			<b>\$17.3 million</b>

#### 5.6: Quantifying Ecosystem Services on National Conservation Lands

Ecosystem services are the benefits that ecosystems provide to people. The four main categories of ecosystem services are provisioning, regulating, habitat, and cultural services. National Conservation Lands provide each of these services in several ways, but the magnitudes of the benefits provided by each service varies considerably across different units. For example, Cascade Siskiyou National Monument has some of the greatest biodiversity of any site in the country, providing significant habitat service values. Canyons of the Ancients, 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.

An important concept of ecosystem services is that ecosystems can and should be valued by federal land managers, when possible, according to Presidential Memorandum M 16 01. Values are typically best applied at a site specific scale. Small scale ecosystem service assessments for Resource Management Plans and associated environmental analyses can provide valuable insights into weighing alternatives. An ecosystem services assessment should begin by identifying the types of services provided by a unit. Table 3 provides a starting point in identifying the ecosystem services provided by the unit. Once identified, any values that are deemed highly important

#### *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.

and/or are likely to be impacted by a decision should be researched further for the feasibility of valuation. A zone socioeconomic specialist with the BLM can provide support in identifying options for conducting an ecosystem services valuation. An example of a straightforward valuation technique for endangered species habitat protection is described in the case study of Grand Canyon Parashant National Monument in Section 5.

#### 5.6.1 Valuing Carbon Sequestration on National Conservation Lands

This report contributes one valuation of an ecosystem service provided by National Conservation Lands: the service of climate regulation. The vegetation and geologic formations on National Conservation Lands store millions of tons of carbon, which helps regulate the global climate and prevent costs associated with climate change. This regulating service provides a benefit to all members of society, as measured by the US Government interagency working group's social cost of carbon estimate. The social cost of carbon is an estimated \$36 per metric ton of CO<sub>2</sub> in 2015, measured in 2007 dollars (EPA 2016). This estimate represents the global cost associated with emitting one ton of carbon dioxide into the atmosphere or, alternatively, the global benefit of sequestering one ton of carbon dioxide from entering the atmosphere. By estimating the amount of carbon sequestered annually by National Conservation Lands, it is possible to place a monetary value on this service. Richardson et al (2014) quantified and monetized terrestrial carbon sequestration on National Park Service units using geographic analysis and the social cost of carbon. This report replicates their work at the system level by quantifying and monetizing terrestrial carbon sequestration on National Conservation Lands units.

The map in Figure 2 depicts the annual amount of carbon sequestered by geologic formations and vegetation in 2015, as estimated by the USGS LandCarbon initiative. The LandCarbon team gathered primary and secondary data on carbon storage characteristics across the United States between 2001-2005. The data was used with various climate change models to project annual rates of change in carbon storage for each year until 2050. For this analysis, the predicted *change* in carbon storage, referred to as carbon sequestration, for 2015 was used under the average climate and economy scenario (Zhu et al. 2012). This scenario, called the A1B global economy scenario, is one of three projections used for climate change scenarios by the Intergovernmental Panel on Climate Change. It assumes a future with "moderate population growth, high economic growth, rapid technological innovation, and balanced energy use." The data, which is publicly available for download ([landcarbon.org](http://landcarbon.org)), provides a digital map at 2000 meters spatial resolution including the contiguous 48 United States, excluding Alaska and

#### *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.

Hawaii. This means that an estimate for each 1000 acre (roughly) square unit of land across the United States was provided. Any units with an area less than 1000 acres were excluded from this analysis.

The map data was uploaded into a GIS software and overlaid with the official National Conservation Lands boundaries. The carbon data was clipped so that only the pixels within official boundaries were included for analysis. Since each pixel represents a 4 million square meter area and is valued in carbon sequestered per square meter, the summed value of all selected pixels was multiplied by 4 million to arrive at a total amount of carbon sequestered within National Conservation Lands boundaries. This value, in grams of carbon, was then converted to grams of *carbon dioxide* by using a conversion factor of 3.67 grams of CO<sub>2</sub> per gram of carbon. Converting this from grams to tons gave an estimate of 3.40 million metric tons of CO<sub>2</sub> sequestered by National Conservation Lands units in 2015. If the social cost of carbon value of \$36 per metric ton of CO<sub>2</sub>, which inflates to \$41 per metric ton of CO<sub>2</sub> in 2015 dollars, is applied to this quantity, this means that the global social benefit of the carbon sequestered by National Conservation Lands in 2015 is about \$140 million.

**Table 9: Estimating the Social Benefit of Carbon Sequestration on National Conservation Lands**

Step-by-Step Calculations of Economic Benefit of Carbon Sequestration on National Conservation Lands		
Calculation Item	Value	Units
Sum of values in all 2000m x2000m pixels within National Conservation Lands unit boundaries:	231,562.58	gC/m <sup>2</sup>
Pixel size:	4,000,000	m <sup>2</sup>
Total grams of carbon sequestered within National Conservation Lands boundaries (product of pixel values and pixel size):	926,250,330,688	g
Carbon to carbon dioxide conversion ratio:	3.67	gCO <sub>2</sub> /gC
Total grams of carbon dioxide sequestered (product of grams of carbon dioxide and conversion ratio):	3,396,251,212,523	g of CO <sub>2</sub>
Grams to tons conversion ratio:	0.000001	Ton/g
Metric tons of carbon dioxide sequestered within National Conservation Lands boundaries (product of grams of CO <sub>2</sub> and gram to ton conversion ratio):	3,396,251	metric tons of CO <sub>2</sub>
Social Cost of Carbon (EPA 2016):	\$41.14	Social benefit per metric ton of CO <sub>2</sub> sequestered
Social Benefit of Carbon	\$139,721,775	dollars (in 2015)

The valuation of carbon sequestration of \$140 million represents the global benefit of the carbon sequestered on National Conservation Lands, or the global cost if that carbon were to be emitted

rather than sequestered. Using these lands for different purposes does not necessarily mean that carbon would not be sequestered *or* that the costs would be incurred by a particular group. It simply depicts the estimated amount of carbon sequestration that occurs within National Conservation Lands boundaries. Additionally, it is possible that by protecting National Conservation Lands units, development has simply shifted to other nearby locations, thereby reducing carbon storage elsewhere. This does not represent an overall benefit, but rather a shifting of the location where the social damage is incurred. Therefore, the carbon sequestration analysis represents a possible tool for accounting for carbon costs in decision making, but its usefulness as describing a true *net* benefit is limited.

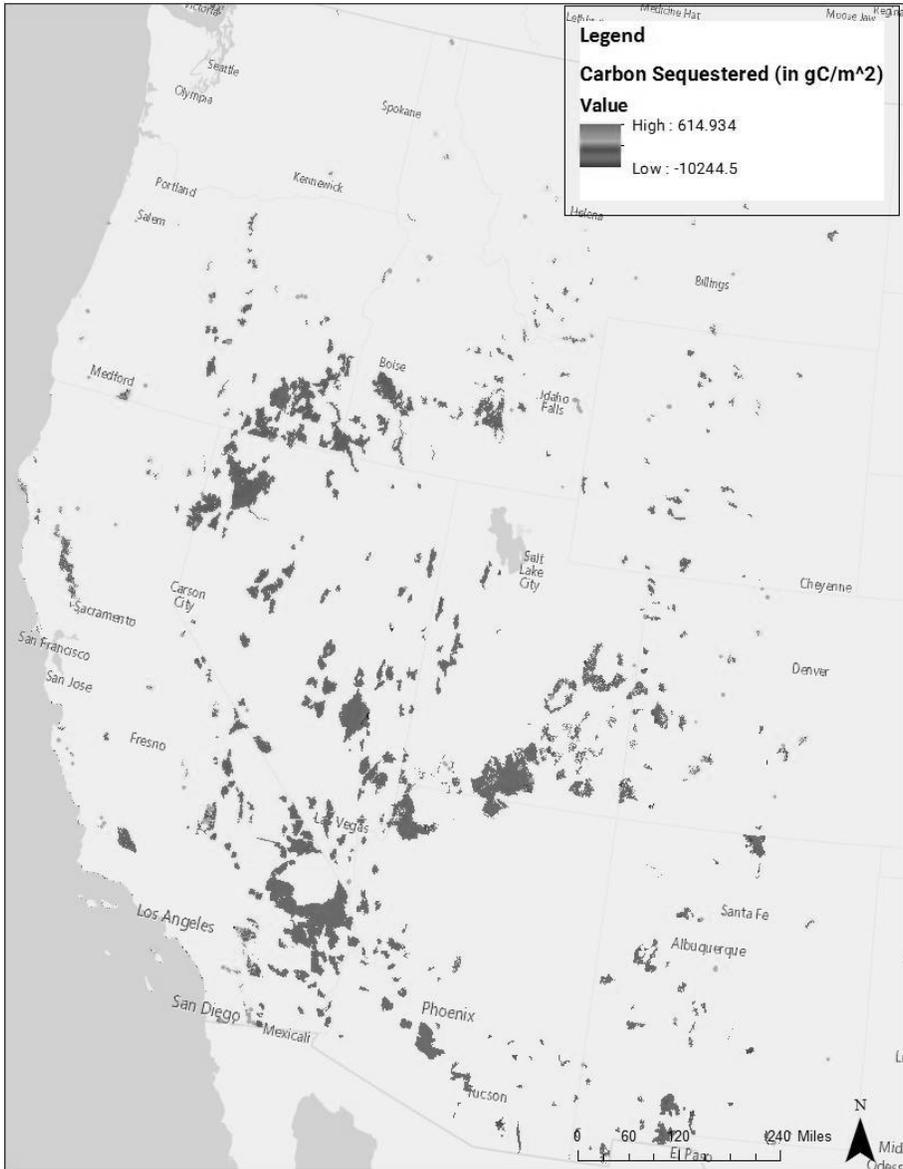
**Figure 2: Carbon Sequestration on National Conservation Lands, 2015**

Note: colored areas on map represent all official National Conservation Lands unit boundaries, excluding rivers and trails. Negative values on the map are shown in blues and greens, while positive values are represented by yellows and reds. A negative or blue area represents an area of high carbon sequestration, or a carbon sink. A positive or red area represents a location of a carbon source. This map was prepared in ArcMap 10.2 by the author with the official National Conservation Lands unit boundaries and carbon sequestration data from Zhu et al (2015).

(On next page)

**Commented [BCM1.2]:** Why were rivers and trails excluded? Does the entire example of Valuing Carbon Sequestration on National Conservation Lands described above not apply to rivers and trails?

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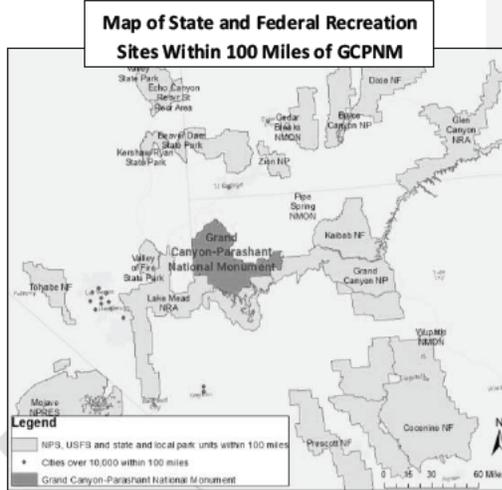
**Section 6: Unit Example of Assessing the Economic Value of a National Monument or NCA**

**Grand Canyon Parashant National Monument**



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

Grand Canyon-Parashant At a Glance	
State	Arizona
Designated	1/11/2006
Acres	1,048,321 (812,581 BLM)
Counties in Planning Area	Coconino and Mohave Counties, Arizona. Also includes parts of Washington (UT) and Clark (NV) Counties
Budget (2015)	\$1,093,906 (plus \$1,616,700 from NPS; \$237,581 in project funding)
Visits ('16)	30,350
Visitor Days ('16)	18,014
Top five types of recreation visits	<ol style="list-style-type: none"> <li>1. Driving for pleasure</li> <li>2. Off highway vehicle use</li> <li>3. Camping</li> <li>4. Hunting other</li> <li>5. Hunting big game</li> </ol>
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



**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 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.

**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.*

**Economic Contributions from Visitor Spending: 2016**

**Calculating Regional Economic Contributions of National Monuments and National Conservation Areas**

Site Name	Grand Canyon-Parashant	Visits (2016)	30,350	Acres	808,747
State	AZ	15yr Average Annual Visitation Growth	15.83%	USFS Comparison Site	Kalibab NF
Date of Designation	1/11/2000	15yr Median Annual Visitation Growth	10.53%	NPS Comparison Site	Pipe Spring NM

Figure 1: Visitor Spending at Grand Canyon-Parashant

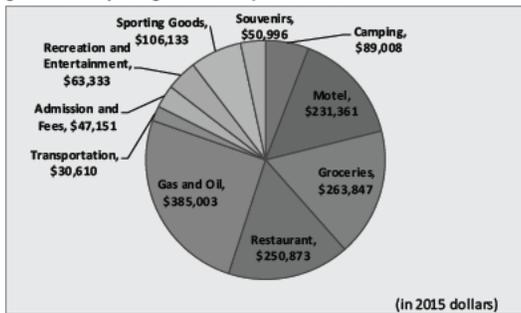


Table 1: Economic Contributions from Visitors to Grand Canyon-Parashant

	Low	High
Average Expenditures per Visit	\$50.03	\$59.41
Total Direct Spending	\$1,518,315	\$1,802,957
Non-BLM Jobs Supported	18	26
Labor Income Supported	\$612,133	\$894,719
Value Added	\$975,502	\$1,478,902
Total Economic Output Supported	\$1,673,916	\$2,453,720

Table 2: Budget and Volunteer Hours

FY15 Budget	\$1,093,906
Volunteer Hours (2015)	1482
Value of Volunteer Contributions	\$33,834

Table 3: Economic Contributions in Context

Economic Contributions per \$1 of FY15 Budget	\$1.89
Economic Contributions per Acre	\$2.55

Grand Canyon Parashant's extremely rural and hard to reach location keeps its annual visitation low: only about 30,000 visits took place in 2016. It has, however, experienced consistent visitation growth since its designation, when it had only received about 13,000 annual visits. Despite low visitation, the unit still contributed between \$1.7 and \$2.5 million in economic activity to the regional economy. Only between 18 and 26 jobs were supported by monument visitation in 2016, and the total economic contributions amounted to about \$1.89 per dollar of budget and just over \$2.50 per acre. Compared with other units these figures are low but they indicate that many of the economic effects associated with the unit are from nonmarket or ecosystem service values.

**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 visitor days in 2016 of the 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.

*Recreation Net Value: \$914,000*

#### Calculating the Economic Value of Recreation at Grand Canyon-Parashant

Recreation Type	Visitor Days (2016)	Average Value (in \$2015)	Total Value
Camping	6,056	\$22.14	\$134,100
General Recreation	5,181	\$53.51	\$277,300
Hunting big game	1,318	\$87.17	\$114,900
Hunting other	1,713	\$64.98	\$111,300
Mountain Biking	202	\$196.39	\$39,700
Hiking	516	\$96.08	\$49,600
OHV	3,028	\$61.87	\$187,400
<b>Total</b>			<b>\$914,100</b>

Visitor days represent one visitor spending 12 hours at a particular activity. One visitor may participate in multiple activities in one day, resulting in a likely overcounting of benefits if the average values are applied to each recreation type. Visitor days reported are for 2016 from BLM's RMIS database. The average values are taken directly from the Benefit Transfer Toolkit's "Average Values" tab for each recreation type in the Intermountain region.

#### Ecosystem Services on Grand Canyon-Parashant National Monument

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, in addition to 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 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, while the high value assumes that non respondents place the same value on the species as the median respondent in the survey.

To place a value on the benefits provided to people by the conservation of desert bighorn sheep, 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 lands in 1996 (BLM 2016b). Assuming that the herd on 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.

**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

Regulating Service: carbon sequestration  
*Net Benefit: \$7.9 million*

The biomass and geologic formations on GCPNM sequester and store carbon, which regulates the climate and improves air quality. This service is measured by estimating the amount of carbon sequestered within the monument boundary using data from the USGS and applying the EPA's latest value of the social cost of carbon (\$41 per ton of CO<sub>2</sub>). Multiplying the tons of carbon dioxide (192,000 in 2015) sequestered on GCPNM by \$41 per ton gives a net benefit from carbon sequestration on GCPNM of \$7.9 million.

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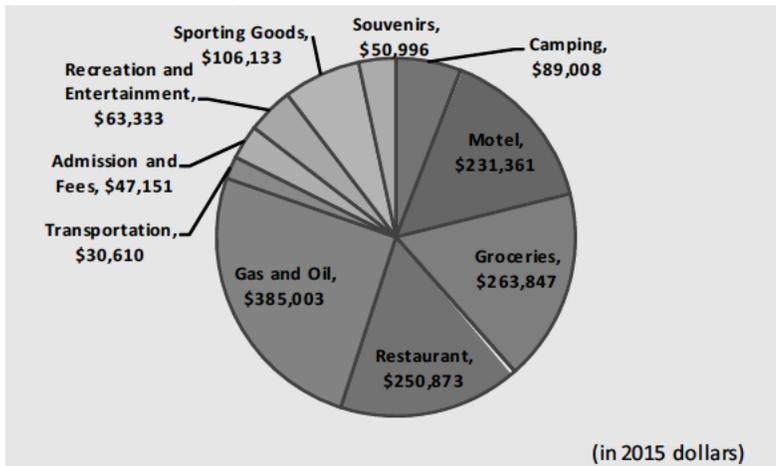
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State	AZ
Date of Designation	1/11/2000

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

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

**Figure 1: Visitor Spending at Grand Canyon-Parashant**



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	Low	High
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**Table 2: Budget and Volunteer Hours**

FY15 Budget	\$1,093,906
Volunteer Hours (2015)	1482
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Economic Contributions per \$1 of FY15 Budget	\$1.89
Economic Contributions per Acre	\$2.55