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Natural Resource Stewardship and Science

National Park Service Visitor Values & Perceptions of Clean Air, Scenic Views & Dark Night Skies

1988-2011

Natural Resource Report NPS/NRSS/ARD/NRR–2013/632

ON THE COVER
Acadia National Park
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National Park Service Visitor Values & Perceptions of Clean Air, Scenic Views & Dark Night Skies

1988-2011

Natural Resource Report NPS/NRSS/ARD/NRR–2013/632

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Introduction

Congress passed the Organic Act in 1916 and created the National Park Service (NPS) to conserve the resources and values of parks, including scenery, "unimpaired" for the enjoyment of future generations. One of the purposes of the Clean Air Act as amended in 1977 is "to preserve, protect, and enhance the air quality in national parks…" The Clean Air Act also has a goal of restoring visibility to natural conditions (absent man-made air pollution) in large national parks and wilderness areas. The NPS has a responsibility to protect air quality and resources affected by air pollution under the NPS Organic Act and the Clean Air Act.

Air pollution impacts all NPS areas. Understanding where air pollution comes from, what it is made of, and how it affects parks and park resources is key to protecting NPS areas for future generations. The NPS Air Resources Division (ARD) works in partnership with parks and others to protect air quality and scenic views in parks. ARD engages in outreach and communication as well as regulatory, planning, and other policy arenas to influence decisions and protect park resources. ARD also conducts and facilitates scientific research, improving understanding about how air pollution impacts parks.

Light and air pollution can both negatively impact the ability to experience dark night skies. The Natural Sounds and Night Skies Division (NSNSD) works to protect, maintain, or restore dark night sky environments in NPS areas. NSNSD works in partnership with parks and others to increase scientific understanding and inspire public appreciation of the value and character of star-filled skies.

Understanding how visitors value clean air, scenic views, and dark night skies, and how impacts to these resources may affect visitor enjoyment of parks is integral to effective park management and resource protection. Visitor surveys are the primary quantitative tool available for assessing the impact that air quality has on visitor enjoyment of parks and the value that visitors place on protecting air quality related attributes.

Visitor studies in many NPS areas have been conducted in a consistent manner for over 20 years. Many survey questionnaires have included questions about clean air, scenic views, and dark night skies. This report compiles and analyzes these results on a servicewide basis, by NPS management region (see Figure 1), and for a group of areas with special Clean Air Act designation. Visitor responses and the values they place on protecting clean air, scenic views, and dark night skies provide interesting new insight into public support for protecting air quality, natural darkness, and related values in the parks.

Figure 1. Map of NPS management regions

Methods

This report uses data from 91 studies at 73 NPS units. The studies were conducted from 1988–2011. Each study involved the distribution of questionnaires to randomly selected visitor groups. Responses related to the park attributes *clean air*, *scenic views*, and *dark night skies* are comprehensively analyzed in this report.

Because questionnaires were distributed to groups of visitors rather than individual visitors, the unit of analysis is "visitor group." A "visitor group" is the group of people with which the individual responding to the questionnaire is travelling. In each study, visitor groups were asked to rate the importance of protecting various park attributes. Groups rated the level of importance by choosing a number between 1 (*not important*) and 5 (*extremely important*). Some questionnaires included all three attributes (*clean air*, *scenic views*, and *dark night skies*) and others only included one or two. In addition, each questionnaire included between 5 and 15 other park attributes. The importance of clean air is covered by 64 studies, 67 cover scenic views, and 41 cover dark night skies. Table 1 details the studies analyzed in this report, with the attributes that were included in the questionnaires. The total sample size (n) of visitor groups that returned the questionnaires were as follows: *clean air*, n=30,319; *scenic views*, n=31,358; *dark night skies*, n=18,345.

For each attribute in every questionnaire, the number of responses is tallied and the proportion of each rating is calculated. These numbers are combined across all studies. The responses *extremely important* and *very important* are combined to present the top ratings of the attributes. Additionally, all attributes are ranked from most important to least important.

In this report, results are tallied in a servicewide manner as well as by NPS management region. Visitor perceptions of *clean air* and *scenic views* are also analyzed for a group of parks with Class I air quality protection status under the Clean Air Act.

Table 1. Park studies used in this report

NPS Unit	Clean Air	Scenic Views	Night Sky	Year
Acadia National Park	√	√	√	2009
Acadia National Park	√	√		1998
Apostle Islands National Lakeshore			√	2004
Arches National Park			√	2003
Badlands National Park			√	2000
Big Cypress National Preserve (spring)	√	√		2007
Big Cypress National Preserve (ORV permit holders)	√	√		2007
Big Cypress National Preserve		√		1999
Black Canyon of the Gunnison National Park	√	√	√	2010
Blue Ridge Parkway (fall)	√	√		2007
Blue Ridge Parkway (spring)	√	√		2007
Bryce Canyon National Park		√		1997
Bryce Canyon National Park	√	√	√	2009
C&O Canal National Historical Park		√	√	2003
Capitol Reef National Park	√	√	√	2008
Capulin Volcano National Monument		√		2003
Carl Sandberg Home National Historic Site	√	√		2008
Catoctin Mountain Park			√	2002
Chattahoochee River National Recreation Area	√	√		1998
Chickasaw National Recreation Area	√		√	2004
Chiricahua National Monument	√			1996
City of Rocks National Reserve	√	√	√	2008
Congaree National Park		√		2005
Crater Lake National Park			√	2001
Craters of the Moon National Monument & Preserve	√	√		1988
Craters of the Moon National Monument & Preserve	√	√	√	2004
Cumberland Gap National Historical Park	√	√		1999
Cumberland Island National Seashore		√		1998
Curecanti National Recreation Area	√	√	√	2010
Cuyahoga Valley National Park	√			2005
Death Valley National Monument	√		√	1990
Death Valley National Park	√	√	√	2009
Death Valley National Park	√	√	√	1996
Delaware Water Gap National Recreation Area	√	√	√	2010
Ebey's Landing National Historical Reserve	√		√	2007
Effigy Mounds National Monument		√		2004
Everglades National Park (spring)			√	2008
Everglades National Park (winter)			√	2008
Fire Island National Seashore	√	√		2008
Fort Bowie National Historic Site	√			1996

Table 1. Park studies used in this report (continued)

NPS Unit	Clean Air	Scenic Views	Night Sky	Year
Fort Larned National Historic Site	√	√	√	2009
Fort Union National Historic Site	√	√	√	2010
Fort Union Trading Post National Historic Site	√	√		2007
Fossil Butte National Monument	√	√	√	2010
George Washington Birthplace National Monument		√		2004
Glen Canyon National Recreation Area (spring)	√	√		2007
Glen Canyon National Recreation Area (summer)	√	√		2007
Grand Teton National Park	√	√	√	2008
Grand Teton National Park		√		1997
Grand Teton National Park	√			1995
Great Smoky Mountains National Park (fall)	√	√		1996
Great Smoky Mountains National Park (summer)	√	√		1996
Great Smoky Mountains National Park (fall)	√	√	√	2008
Great Smoky Mountains National Park (spring)	√	√	√	2008
Homestead National Monument of America	√	√	√	2009
Horseshoe Bend National Military Park	√	√		2008
Johnstown Flood National Memorial		√		2005
Joshua Tree National Park	√		√	2010
Joshua Tree National Park	√			2004
Kalaupapa National Historical Park		√		2010
Katmai National Park and Preserve	√	√		2006
Kenai Fjords National Park		√		1999
Keweenaw National Historical Park		√		2004
Kings Mountain National Military Park	√	√		2006
Lassen Volcanic National Park		√		1999
Lava Beds National Monument	√	√	√	2007
Little River Canyon National Preserve	√	√		2010
Mammoth Cave National Park	√		√	2006
Minute Man National Historical Park	√	√	√	2007
Mojave National Preserve	√	√	√	2003
Mojave National Preserve	√	√	√	1997
Monocacy National Battlefield	√			2006
New River Gorge National River		√		2004
Ninety Six National Historic Site	√	√		2010
Niobrara National Scenic River	√	√	√	2010
Olympic National Park		√		2000
Outer Banks Group parks: Cape Hatteras National Seashore, Fort Raleigh National Historic Site, Wright Brothers National Memorial		√	√	2002
Perry's Victory and International Peace Memorial	√	√		2009
Pinnacles National Monument		√	√	2002
Rainbow Bridge National Monument	√	√		2007

Table 1. Park studies used in this report (continued)

NPS Unit	Clean Air	Scenic Views	Night Sky	Year
Richmond National Battlefield Park	√			2010
Rock Creek Park	√	√		1999
Rocky Mountain National Park	√		√	2011
Rocky Mountain National Park	√		√	2010
Sequoia and Kings Canyon National Parks	√		√	2002
Shenandoah National Park	√			2001
Sleeping Bear Dunes National Lakeshore	√	√	√	2009
St. Croix National Scenic Riverway		√		1999
Timpanogos Cave National Monument	√	√		2005
Whiskeytown National Recreation Area		√		1998
Yellowstone National Park	√			1995

Results

Clean Air

Many resources in parks are affected by air pollution. For example, the ability to appreciate scenic vistas is highly dependent on good visibility. Poor visibility caused by air pollution can affect park visitors' enjoyment of scenic views. Human-made pollution can harm ecological resources, including water quality, soils, plants, and animals. Air pollution may also cause or intensify respiratory symptoms for some visitors and employees at NPS areas. The harmful effects of air pollution on a variety of park visitor experiences could ultimately cause impacts on park visitation and subsequent economic impacts in surrounding communities.

Servicewide

Clean air, and up to 14 other resource attributes, were rated in 64 studies conducted from 1988–2011 in 49 NPS units. These studies gathered survey responses from 30,319 separate visitor groups. Each visitor group rated *clean air* on a five point scale with 1 being *not important* and 5 being *extremely important*.

As shown in Figure 2, clean air was *extremely important* or *very important* to 88% of all visitor groups (n=30,319), 8% thought it was *moderately important*, and 4% responded that clean air was *somewhat important* or *not important*.

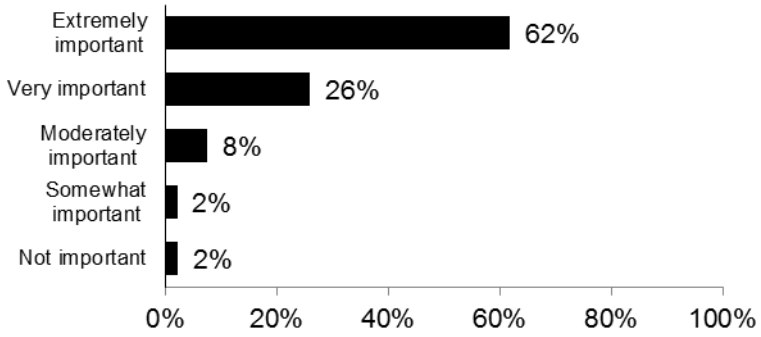


Figure 2. Importance ratings for clean air. n=30,319 visitor groups from 64 studies in 49 NPS units from 1988–2011.

Responses are also analyzed based on the year the study was conducted to see if visitor values related to clean air have changed over time. In this analysis, responses for each year from visitor groups are combined if they responded that clean air was an *extremely important* or *very important* attribute to protect. Results show that from 1988–2011, the percentage of visitor groups that placed high value on clean air varied between 42% and 98% (Table 2). The percentage appears to be trending up with 80% of the responses in the 1990s and 91% of the responses in the 2000s considering clean air to be *extremely important* or *very important*.

Table 2. Yearly percent of visitor groups that marked clean air as *extremely important* or *very important*, n=30,319 visitor groups

Number of studies	Year	Extremely Important or Very Important *	n=visitor groups
1	1988	73%	268
0	1989	--	0
1	1990	42%	310
0	1991	--	0
0	1992	--	0
0	1993	--	0
0	1994	--	0
2	1995		1,070
5	1996	85%	2,913
1	1997	84%	484
2	1998	96%	1,728
2	1999	90%	988
0	2000	--	0
1	2001	98%	665
1	2002	93%	543
1	2003	76%	327
3	2004	93%	1,373
2	2005	90%	1,127
4	2006	91%	1,386
11	2007	80%	5,486
8	2008	92%	3,609
7	2009	91%	3,281
11	2010	91%	4,187
1	2011	94%	574
64		88%	**30,319**

Data from studies at each NPS unit were also analyzed to determine what overall rank of importance each attribute received from the visitor group responses. Clean air was one of the top five most important attributes worthy of protection in every study. In fact, 49% of all the studies ranked it as either the 1st or 2nd most important attribute. Figure 3 shows the percentage of each ranking for clean air. Table 3 provides details about the top five ranked attributes for each of the 64 studies. The rank of clean air is in bold and listed numerically in Table 3.

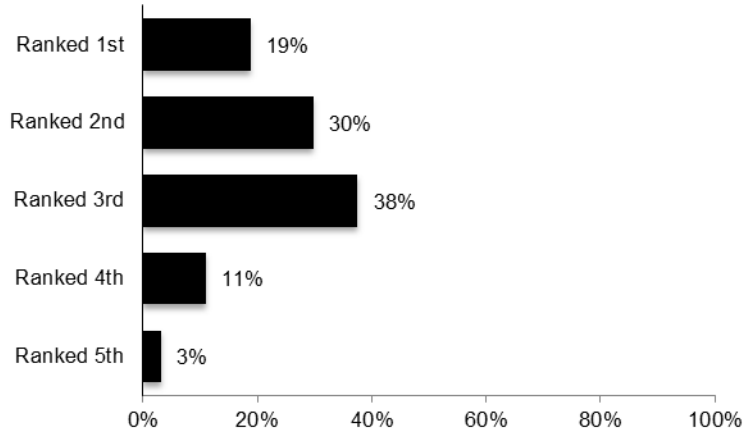


Figure 3. Ranked importance of clean air, n=64 studies in 49NPS units

Table 3. Top-ranked attributes from 64 studies that included questions regarding the importance of protecting clean air.

Year	NPS Unit	Clean Air Rank	Top five ranked attributes
1998	Acadia National Park	2	1) scenic views, **2) clean air**, 3) clean water, 4) recreational opportunities, 5) solitude/quiet
2009	Acadia National Park	2	1) clean water, **2) clean air**, 3) scenic views, 4) natural quiet/sounds of nature, 5) native wildlife
2007	Big Cypress National Preserve (spring)	2	1) native wildlife, **2) clean air**, 3) clean water, 4) natural setting, 5) native plants
2007	Big Cypress National Preserve (ORV permit holders)	3	1) native wildlife, 2) clean water, **3) clean air**, 4) native plants, 5) recreational opportunities
2010	Black Canyon of the Gunnison National Park	2	1) clean water, **2) clean air**, 3) scenic views without development, 4) natural quiet/sounds of nature, 5) cultural
2007	Blue Ridge Parkway (fall)	2	1) scenic drive/scenic views, **2) clean air**, 3) clean water, 4) natural quiet/sounds of nature, 5) native plants and animals
2007	Blue Ridge Parkway (spring)	2	1) scenic drive/scenic views, **2) clean air**, 3) clean water, 4) natural quiet/sounds of nature, 5) native plants and animals
2009	Bryce Canyon National Park	3	1) scenic views, 2) geological formations, **3) clean air**, 4) scenic drive, 5) plants and animals
2008	Capitol Reef National Park	2	1) scenic/natural vistas, **2) clean air**, 3) natural quiet/sounds of nature, 4) clean water, 5) solitude
2008	Carl Sandberg Home National Historic Site	1	**1) clean air**, 2) clean water, 3) scenic views, 4) natural quiet/sounds of nature, 5) native plants and wildlife
1998	Chattahoochee River National Recreation Area	1	**1) clean air**, 2) clean water, 3) views from the park, 4) land development adjacent to park, 5) conflicts between park users
2004	Chickasaw National Recreation Area	1	**1) clean air**, 2) recreational opportunities, 3) endangered species, 4) native plants/animals, 5) clean water
1996	Chiricahua National Monument	3	1) scenery, 2) quiet, **3) clean air**, 4) wilderness, 5) wildlife
2008	City of Rocks National Reserve	1	**1) clean air/visibility**, 2) scenic views, 3) recreational opportunities, 4) clean water, 5) dark starry night sky
1988	Craters of the Moon National Monument & Preserve	3	1) scenic views, 2) rock formations, **3) clean air**, 4) wildlife, 5) natural forest
2004	Craters of the Moon National Monument & Preserve	3	1) geology/rock formations, 2) scenic views, **3) clean air**, 4) scenic loop drive, 5) wildlife
1999	Cumberland Gap National Historical Park	2	1) scenic views, **2) air quality**, 3) wilderness, 4) quiet, 5) hiking opportunities
2010	Curecanti National Recreation Area	2	1) clean water, **2) clean air**, 3) scenic views, 4) recreational opportunities, 5) native plants and animals
2005	Cuyahoga Valley National Park	3	1) recreational opportunities, 2) scenery, **3) clean air**, 4) natural quiet, 5) escape from urban
1990	Death Valley National Monument	5	1) experiencing the desert, 2) other, 3) solitude, 4) viewing wildlife, **5) clean air**
1996	Death Valley National Park	4	1) scenic vistas, 2) desert experience, 3) wilderness/open space, **4) clean air**, 5) quiet
2009	Death Valley National Park	3	1) Scenic views, 2) recreational opportunities, **3) clean air**, 4) geological features, 5) natural quiet/sounds of nature
2010	Delaware Water Gap National Recreation Area	1	**1) clean air**, 2) river water with outstanding water quality, 3) clean drinking water, 4) recreational opportunities, 5) natural quiet/sounds of nature

Table 3. Top-ranked attributes from 64 studies that included questions regarding the importance of protecting clean air (continued)

Year	NPS Unit	Clean Air Rank	Top five ranked attributes
2007	Ebey's Landing National Historical Reserve	1	**1) clean air**, 2) clean water, 3) natural quiet/sounds of nature, 4) historic views/landscapes, 5) views without development
2008	Fire Island National Seashore	4	1) beaches and dunes, 2) clean water, 3) safe, crime-free environment, **4) clean air**, 5) Island communities
1996	Fort Bowie National Historic Site	3	1) historic setting, 2) scenery, **3) clean air**, 4) quiet, 5) solitude
2009	Fort Larned National Historic Site	4	1) historic sites and buildings, 2) repair of historic structures, 3) clean water, **4) clean air**, 5) historical scenic views
2010	Fort Union National Historic Site	3	1) historic structures, 2) archaeology, **3) clean air**, 4) scenic views without development, 5) Santa Fe trail ruts
2007	Fort Union Trading Post National Historic Site	4	1) archeological & historic sites, 2) clean water, 3) scenic views, **4) clean air**, 5) natural quiet/sounds of nature
2010	Fossil Butte National Monument	3	1) fossils, 2) clean water, **3) clean air**, 4) native wildlife, 5) scenic views
2007	Glen Canyon National Recreation Area (spring)	1	**1) clean air/visibility**, 2) clean water, 3) scenic views, 4) natural setting, 5) native wildlife
2007	Glen Canyon National Recreation Area (summer)	3	1) clean water, 2) scenic views, **3) clean air**, 4) natural setting, 5) native wildlife
2008	Grand Teton National Park	2	1) scenic views, **2) clean air/visibility**, 3) opportunities to view wildlife in park ecosystem, 4) clean water, 5) natural quiet/sounds of nature
1995	Grand Teton National Park	3	1) scenery, 2) wildlife, **3) clean air**, 4) quiet, 5) solitude
1996	Great Smoky Mountains National Park (fall)	2	1) scenic views, **2) clean air**, 3) native plants/animals, 4) quiet, 5) solitude
1996	Great Smoky Mountains National Park (summer)	2	1) scenic views, **2) clean air**, 3) native plants/animals, 4) quiet, 5) solitude
2008	Great Smoky Mountains National Park (fall)	2	1) scenic views, **2) clean air/visibility**, 3) clean water, 4) animals, 5) natural quiet/sounds of nature
2008	Great Smoky Mountains National Park (spring)	2	1) scenic views, **2) clean air/visibility**, 3) clean water, 4) natural quiet/sounds of nature, 5) animals
2009	Homestead National Monument of America	3	1) historic sites and buildings, 2) clean water, **3) clean air**, 4) natural scenic views, 5) native plants
2008	Horseshoe Bend National Military Park	3	1) archeological & historic sites, 2) clean water, **3) clean air**, 4) scenic views, 5) native plants
2004	Joshua Tree National Park	1	**1) clean air**, 2) natural quiet/sounds of nature, 3) views without development, 4) solitude, 5) access to rock formations
2010	Joshua Tree National Park	2	1) view without development, **2) clean air**, 3) natural quiet/sounds of nature, 4) desert plants/wildflowers, 5) native wildlife
2006	Katmai National Park and Preserve	3	1) bear watching, 2) clean water, **3) clean air**, 4) scenic views, 5) wilderness
2006	Kings Mountain National Military Park	1	**1) clean air**, 2) clean water, 3) battlefield of Oct. 7, 1780, 4) historic landscape, 5) scenic views
2007	Lava Beds National Monument	3	1) caves/volcanic landscape, 2) scenic views, 3) archeological sites, **4) clean air**, 5) natural quiet/sounds of nature
2010	Little River Canyon National Preserve	2	1) clean water, **2) clean air**, 3) scenic views, 4) natural quiet/sounds of nature, 5) scenic views without development
2006	Mammoth Cave National Park	3	1) cave features/environment, 2) clean water, **3) clean air/visibility**, 4) wildlife, 5) natural quiet

Table 3. Top-ranked attributes from 64 studies that included questions regarding the importance of protecting clean air. (continued)

Year	NPS Unit	Clean Air Rank	Top five ranked attributes
2007	Minute Man National Historical Park	3	1) historic views, 2) historic buildings/cultural resources, **3) clean air**, 4) commemoration of historic events, 5) clean water
1997	Mojave National Preserve	3	1) wilderness/open space, 2) solitude/quiet, **3) clean air**, 4) desert experiences, 5) scenic vistas
2003	Mojave National Preserve	1	**1) clean air**, 2) wilderness/open spaces, 3) solitude/quiet, 4) scenic vistas, 5) desert experience
2006	Monocacy National Battlefield	4	1) historic structures/buildings, 2) preserved battlefield landscape, 3) educational opportunities, **4) clean air/visibility**, 5) green/open space
2010	Ninety Six National Historic Site	3	1) historic structures, 2) clean water, **3) clean air**, 4) educational opportunities, 5) natural quiet
2010	Niobrara National Scenic River	3	1) clean water, 2) scenic views, **3) clean air**/visibility, 4) recreational opportunities, 5) natural quiet/sounds of nature
2009	Perry's Victory and International Peace Memorial	2	1) clean water, **2) clean air**, 3) memorial, 4) scenic views, 5) historic sites & buildings
2007	Rainbow Bridge National Monument	3	1) scenic views, 2) clean water, 3) untouched/ undeveloped landscapes, **4) clean air**, 5) native plants and animals
2010	Richmond National Battlefield Park	5	1) historic structures/buildings, 2) preserved battlefield landscape, 3) historic trails with interpretation, 4) educational opportunities, **5) clean air**
1999	Rock Creek Park	3	1) scenic beauty, 2) recreational opportunities, **3) clean air**, 4) clean water, 5) solitude/quiet
2010	Rocky Mountain National Park	4	1) native wildlife, 2) clean water, 3) natural scenery/undeveloped vistas, **4) clean air**, 5) natural quiet/sounds of nature
2011	Rocky Mountain National Park	3	1) natural scenery/undeveloped vistas, 2) clean water, **3) clean air**, 4) native wildlife, 5) natural quiet/sounds of nature
2002	Sequoia and Kings Canyon National Parks	2	1) clean water, **2) clean air**, 3) endangered species, 4) natural quiet, 5) recreational opportunities
2001	Shenandoah National Park	1	**1) clean air**, 2) forest, 3) wildlife, 4) clean water, 5) natural quiet/sounds of nature
2009	Sleeping Bear Dunes National Lakeshore	2	1) clean water, **2) clean air**, 3) scenic views, 4) sand dunes, 5) natural areas
2005	Timpanogos Cave National Monument	1	**1) clean air**, 2) scenic views, 3) cave features/environment, 4) natural quiet/sounds of nature, 5) native plants/wildlife
1995	Yellowstone National Park	3	1) scenery, 2) wildlife, **3) clean air**, 4) thermal features, 5) quiet

Regional

All seven NPS management regions had studies that included questions about the importance of clean air. Table 4 shows the number of studies and the number of visitor group responses in each region. Visitor responses show similar trends in all of the regions. Combined proportions of *extremely important* and *very important* for each region ranged from 81% to 97%, as shown in Figure 4. In all regions, less than 8% of visitor groups indicated that clean air was *somewhat* or *not* important (Figure 5).

The ranked importance of clean air varied among the regions with the Midwest Region ranking it the 1st or 2nd most important criteria 29% of the time and the Southeast Region ranking it 1st or 2nd 75% of the time (Figure 6). The Alaska Region and National Capital Region—each composed of a single study—both ranked air quality as the 3rd most important attribute to protect. Individual region results are shown in Figures 7–13.

Table 4. Studies, by region, that include questions regarding the importance of protecting clean air

	Number of Studies	n=visitor groups
Alaska Region	1	493
Pacific West Region	12	4,971
Intermountain Region	19	8,344
Midwest Region	7	3,134
Southeast Region	16	8,793
Northeast Region	8	4,060
National Capital Region	1	524

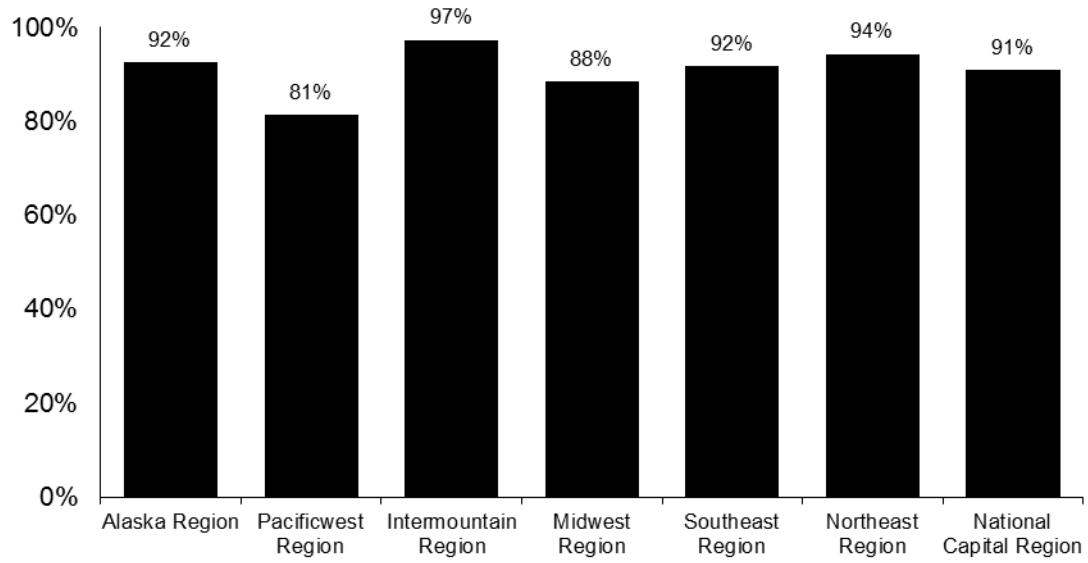


Figure 4 Regional results of clean air rated by visitor groups as *extremely important* or *very* important

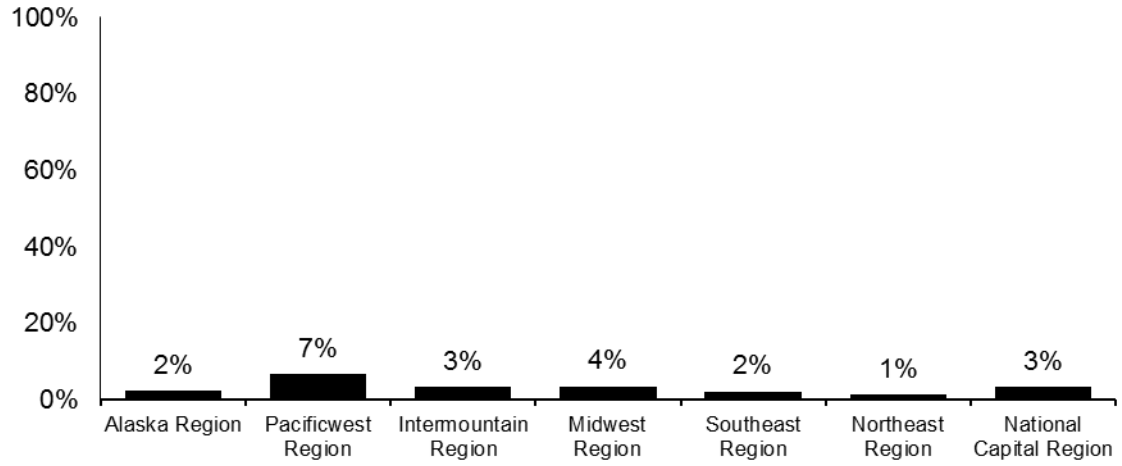


Figure 5. Regional results of clean air rated as *somewhat* or *not* important

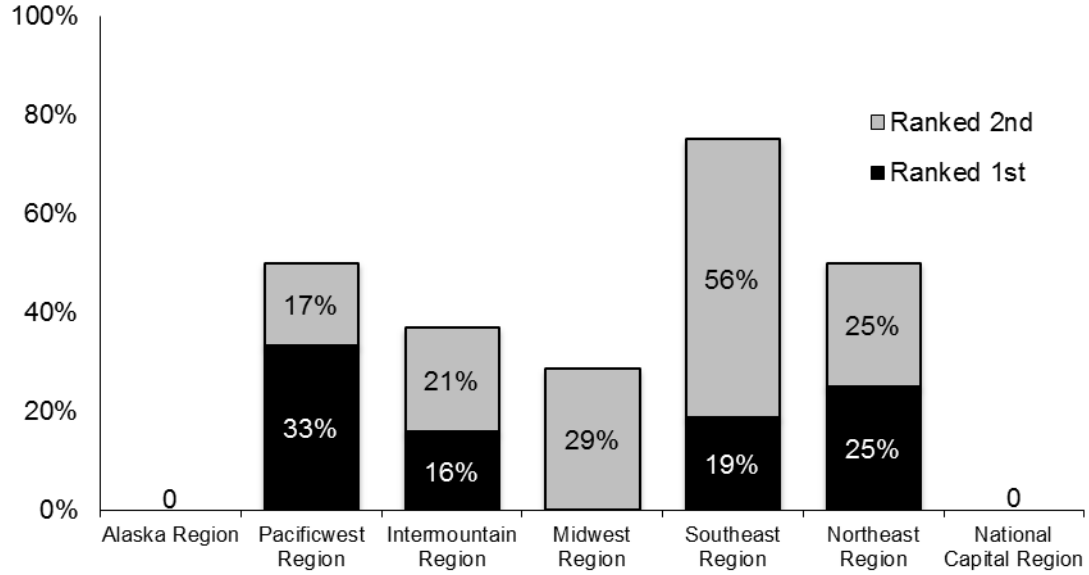


Figure 6. Percent, by region, that ranked clean air as 1st or 2nd most important

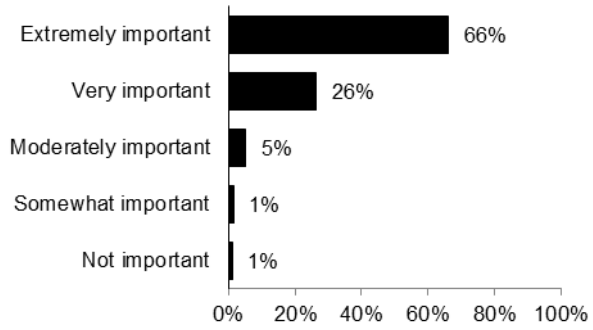


Figure 7. Alaska Region, n=493

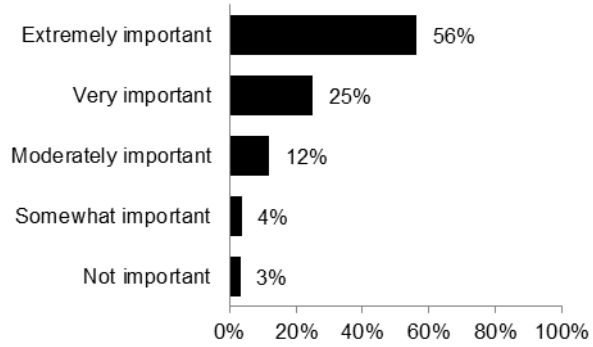


Figure 8. Pacific West Region, n=4,971

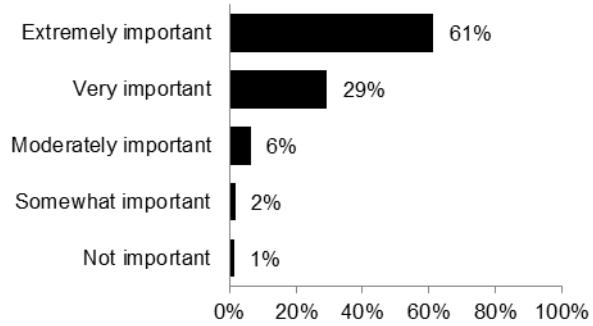


Figure 9. Intermountain Region, n=8,344

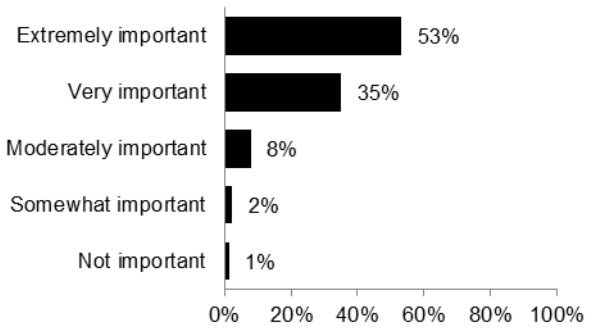


Figure 10. Midwest Region, n=3,134

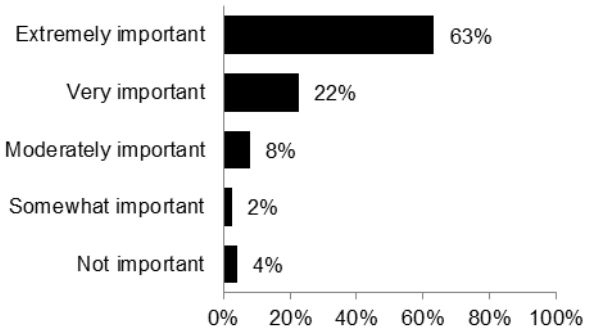


Figure 11. Southeast Region, n=8,793

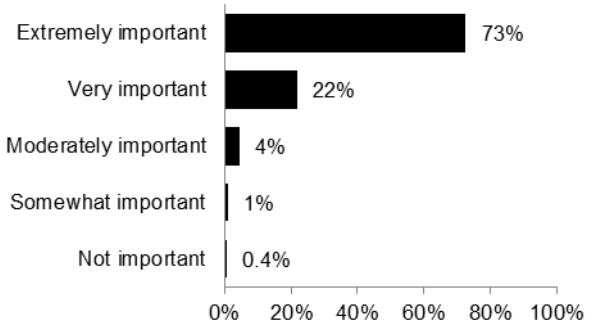


Figure 12 Northeast Region, n=4,060

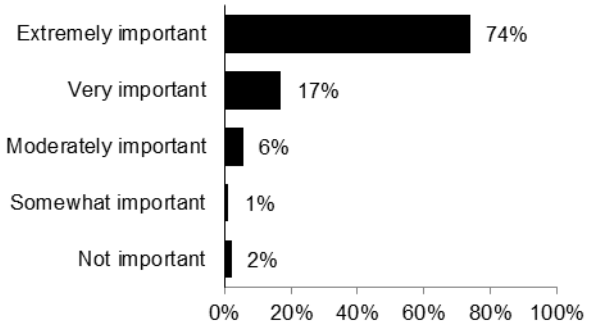


Figure 13. National Capital Region, n=524

Class I Air Quality Areas

Class I air quality areas have the highest level of air quality protection under the Clean Air Act. These areas are defined as national parks larger than 6,000 acres or wilderness areas over 5,000 acres that were in existence when the Clean Air Act was amended in 1977.

The NPS manages 48 national parks that are classified as Class I air quality areas. Clean air was rated in 22 studies from 1988–2011 in 14 NPS Class I air quality areas (Table 5). These surveys represent 13,110 separate visitor groups (n=13,110). Results show that 91% of visitor groups to these parks felt that clean air was either *extremely important* or *very important* (Figure 14). This percentage is slightly higher than for NPS areas servicewide (see Figure 2 for comparison). Only 2% of visitor groups in Class I air quality areas felt that clean air was *somewhat important* or *not important.* Figure 15 shows that 54% of the 22 NPS unit studies in Class I air quality areas ranked clean air as either the 1st or 2nd most important natural attribute worth protecting. All of the studies ranked it as one of the top four most important attributes for protection. Clean air is closely related to scenic views. As detailed later in this report, 89% of NPS studies relating to scenic views rank scenic views as either *extremely important* or *very important.*

Table 5. Park studies for Class I air quality areas that surveyed the importance of clean air

NPS Unit	Year
Acadia National Park	1998
Acadia National Park	2009
Bryce Canyon National Park	2009
Capitol Reef National Park	2008
Chiricahua National Monument	1996
Craters of the Moon NM & PRES	1988
Craters of the Moon NM & PRES	2004
Grand Teton National Park	2008
Grand Teton National Park	1995
Great Smoky Mountains NP (fall)	1996
Great Smoky Mountains NP (summer)	1996
Great Smoky Mountains National Park (fall)	2008
Great Smoky Mountains National Park (spring)	2008
Joshua Tree National Park	2004
Joshua Tree National Park	2010
Lava Beds National Monument	2007
Mammoth Cave National Park	2006
Rocky Mountain National Park	2010
Rocky Mountain National Park	2011
Sequoia and Kings Canyon National Parks	2002
Shenandoah National Park	2001
Yellowstone National Park	1995

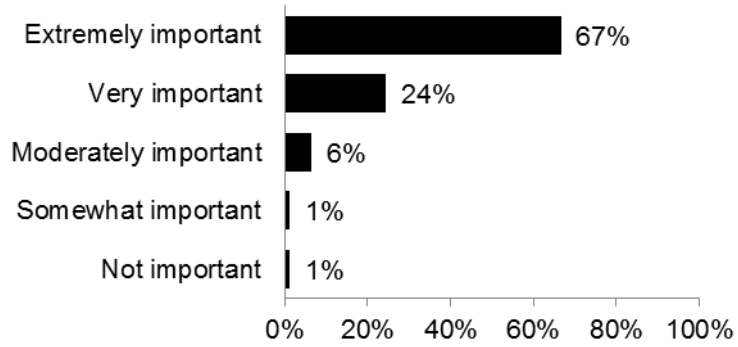


Figure 14. Importance ratings for clean air in Class I air quality areas, n=13,110 visitor groups from 22 studies in 14 NPS park units

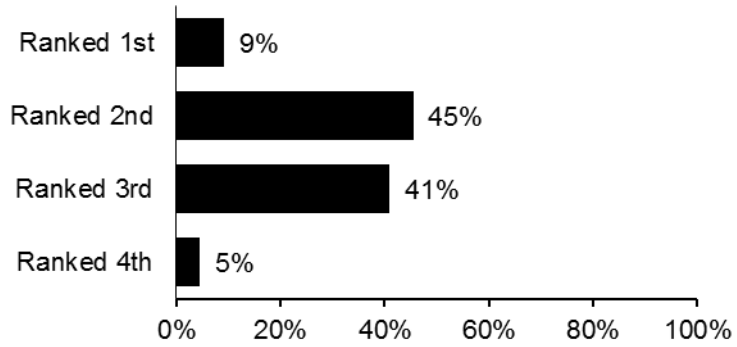


Figure 15. Ranked importance of clean air in Class I air quality areas, n= 22 studies in 14 NPS park units

Scenic Views

Many visitors come to parks to enjoy the spectacular vistas. The ability to see landscape features, color and detail in distant views can be effected by air pollution. Scenic views and historic landscapes can also be marred by certain development on public and private lands outside park boundaries.

Servicewide

Scenic views, and up to 14 other resource attributes, were rated in 67 studies conducted from 1988–2011 in 53 NPS units. The surveys gathered responses from 31,358 separate visitor groups (n=31,358). Each visitor group rated *scenic views* on a five point scale with 1 being *not important* and 5 being *extremely important*.

Scenic views were *extremely important* or *very important* to 90% of visitor groups, 7% thought it was *moderately important,* and 2% responded that scenic views were *somewhat important* or *not important,* as shown in Figure 16.

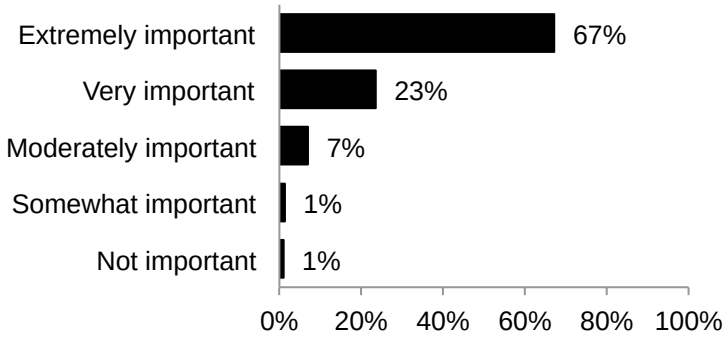


Figure 16. Importance ratings for scenic views, n=31,358 visitor groups from 67 studies in 53 NPS units from 1988 to 2011

Survey responses are also analyzed by the year the study was conducted, to see if visitor values related to scenic views have changed over time. In this analysis responses from visitor groups are combined if they responded that protecting scenic views was *extremely important* or *very important*. Results show that from 1988–2011, the percentage of visitor groups that placed high value on scenic views varied between 79% and 95% (Table 6).

Table 6. Yearly percent of visitor groups that marked scenic views as *extremely important* or *very important*, n=31,358 visitor groups

Number of studies	Year	Extremely Important or Very Important	n=visitor groups
1	1988	82%	286
0	1989	-	0
0	1990	-	0
0	1991	-	0
0	1992	-	0
0	1993	-	0
0	1994	-	0
0	1995	-	0
3	1996	94%	2,587
3	1997	90%	1,550
4	1998	88%	2,457
6	1999	91%	2,959
1	2000	92%	911
0	2001	-	0
2	2002	79%	1,063
3	2003	88%	1,202
5	2004	92%	1,764
3	2005	86%	811
2	2006	88%	707
10	2007	92%	5,093
8	2008	95%	3,669
7	2009	92%	3,283
9	2010	87%	3,016
67		**90%**	**31,358**

Data from each visitor survey were also analyzed to determine what overall rank of importance each attribute received from the visitor group responses. Scenic views were ranked one of the top five most important attributes worthy of protection in 90% of the studies and 57% of the studies ranked scenic views as either the 1st or 2nd most important attribute. Figure 17 shows the percentage of each ranking for scenic views. Table 7 provides details about the top five ranked attributes for the 67 NPS studies that considered scenic views. The rank of scenic views is listed numerically as well as in bold typeface.

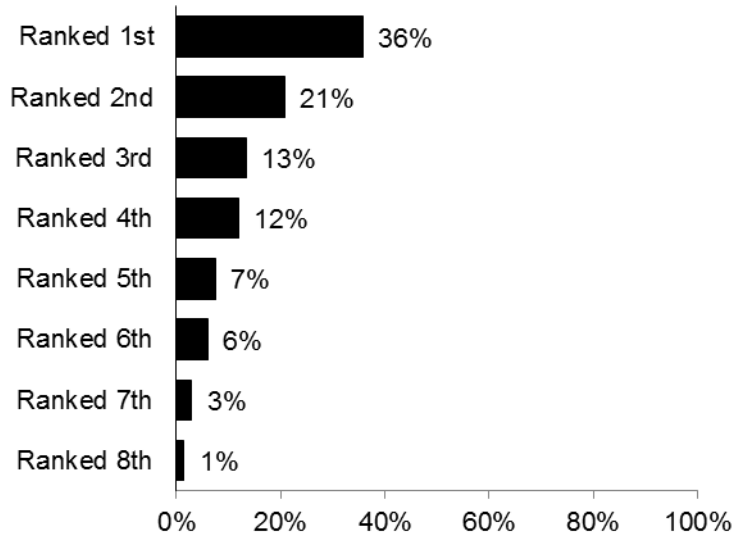


Figure 17. Ranked importance of scenic views, n=67 studies in 53 NPS units

Table 7. Top-ranked attributes for protection from 67 studies that included questions regarding the importance of protecting scenic views.

Year	NPS Unit	Scenic Views Rank	Top five ranked attributes
1988	Craters of the Moon National Park	1	1) **scenic views** 2) rock formations 3) clean air 4) wildlife 5) natural forest
1996	Death Valley National Park	1	1) **scenic vistas** 2) desert experience 3) wilderness/open space 4) clean air 5) quiet
1996	Great Smoky Mountains National Park (fall)	1	1) **scenic views** 2) clean air 3) native plants/animals 4) quiet 5) solitude
1996	Great Smoky Mountains National Park (summer)	1	1) **scenic views** 2) clean air 3) native plants/animals 4) quiet 5) solitude
1997	Bryce Canyon National Park	5	1) scenery 2) wilderness/open spaces 3) recreational opportunities 4) quiet 5) **clear view of scenery**
1997	Grand Teton National Park	1	1) **scenic views** 2) native plants 3) quiet 4) solitude 5) recreational opportunities
1997	Mojave National Preserve	5	1) wilderness/open space 2) solitude/quiet 3) clean air 4) desert experiences 5) **scenic vistas**
1998	Acadia National Park	1	1) **scenic views** 2) clean air 3) clean water 4) recreational opportunities 5) solitude/quiet
1998	Chattahoochee River National Recreation Area	2	1) clean air 2) clean water 3) **views from the park** 4) land development adjacent to park 5) conflicts between park users
1998	Cumberland Island National Seashore	3	1) no development 2) wilderness 3) **scenic views** 4) plants/animals 5) quiet
1998	Whiskeytown National Recreation Area	1	1) **scenic views** 2) solitude/quiet 3) plants/animals 4) non-motorized water recreation 5) frontcountry recreation
1999	Big Cypress National Preserve	2	1) viewing wildlife 2) **scenic views** 3) experiencing wilderness 4) birdwatching 5) solitude
1999	Cumberland Gap National Historical Park	1	1) **scenic views** 2) air quality 3) wilderness 4) quiet 5) hiking opportunities
1999	Kenai Fjords National Park	1	1) **scenic views** 2) access to glacier 3) wildlife 4) recreational opportunities 5) quiet
1999	Lassen Volcanic National Park	1	1) **scenic views** 2) natural features 3) wilderness 4) solitude/quiet 5) recreational opportunities
1999	Rock Creek Park	1	1) **scenic beauty** 2) recreational opportunities 3) clean air 4) clean water 5) solitude/quiet
1999	St. Croix National Scenic Riverway	3	1) water quality 2) native plants/animals 3) **scenic views** 4) free-flowing river 5) solitude
2000	Olympic National Park	2	1) safe, crime free environment 2) **scenic views** 3) native plants/animals 4) protecting endangered species 5) quiet/sounds of nature
2002	Outer Banks Group parks: Cape Hatteras National Seashore, Fort Raleigh National Historic Site, Wright Brothers National Memorial	5	1) preserving historic sites 2) beach access 3) educational opportunities 4) natural open space 5) **scenic views**
2002	Pinnacles National Monument	2	1) clean air/water 2) **scenic views** 3) native plants/animals 4) natural quiet 5) safe environment
2003	C&O Canal National Historical Park	4	1) clean air/water 2) natural surroundings 3) safe, crime-free environment 4) **scenic views** 5) natural quiet/sounds of nature
2003	Capulin Volcano National Monument	1	1) **scenic views** 2) natural setting 3) wildlife 4) native plants 5) sounds of nature/natural quiet

Table 7. Top-ranked attributes for protection from 67 studies that included questions regarding the importance of protecting scenic views (continued)

Year	NPS Unit	Scenic Views Rank	Top five ranked attributes
2003	Mojave National Preserve	4	1) clean air 2) wilderness/open spaces 3) solitude/quiet 4) **scenic vistas** 5) desert experience
2004	Craters of the Moon NM & PRES	2	1) geology/rock formations 2) **scenic views** 3) clean air 4) scenic loop drive 5) wildlife
2004	Effigy Mounds National Monument	1	1) **scenic views** 2) water quality 3) archeological/historic 4) native plants/animals 5) free-flowing Yellow River
2004	George Washington Birthplace NM	1	1) **scenic views** 2) historic lands 3) natural quiet 4) colonial buildings 5) birthplace
2004	Keweenaw National Historical Park	1	1) **views and vistas** 2) historic preservation 3) historic landscapes 4) historic buildings 5) natural quiet
2004	New River Gorge National River	2	1) natural setting 2) **scenic views** 3) water quality 4) outdoor recreation 5) native plants
2005	Congaree National Park	5	1) native wildlife 2) natural setting 3) native plants 4) natural quiet/sounds of nature 5) **scenic views**
2005	Johnstown Flood National Memorial	2	1) South Fork Dam abutment 2) **scenic views** of park resources 3) historic landscapes 4) South Fork hunting and fishing club 5) south fork historic district
2005	Timpanogos Cave National Monument	2	1) clean air 2) **scenic views** 3) cave features/environment 4) natural quiet/sounds of nature 5) native plants/wildlife
2006	Katmai National Park and Preserve	4	1) bear watching 2) clean water 3) clean air 4) **scenic views** 5) wilderness
2006	Kings Mountain National Military Park	4	1) clean air 2) clean water 3) battlefield of Oct. 7, 1780 4) historic landscape 5) **scenic views**
2007	Big Cypress National Preserve (OVR permit holders)	8	1) native wildlife 2) clean water 3) clean air 4) native plants 5) recreational opportunities
2007	Big Cypress National Preserve (spring)	7	1) native wildlife 2) clean air 3) clean water 4) natural setting 5) native plants
2007	Blue Ridge Parkway (fall)	1	1) **scenic drive/scenic views** 2) clean air 3) clean water 4) natural quiet/sounds of nature 5) native plants and animals
2007	Blue Ridge Parkway (spring)	1	1**) scenic drive/scenic views** 2) clean air 3) clean water 4) natural quiet/sounds of nature 5) native plants and animals
2007	Fort Union Trading Post National Historic Site	3	1) archeological & historic sites 2) clean water 3) **scenic views** 4) clean air 5) natural quiet/sounds of nature
2007	Glen Canyon National Recreation Area (spring)	2	1) clean water 2) **scenic views** 3) clean air 4) natural setting 5) native wildlife
2007	Glen Canyon National Recreation Area (summer)	3	1) clean air/visibility 2) clean water 3) **scenic views** 4) natural setting 5) native wildlife
2007	Lava Beds National Monument	2	1) caves/volcanic landscape 2) **scenic views** 3) archeological sites 4) clean air 5) natural quiet/sounds of nature
2007	Minute Man National Historical Park	6	1) historic views 2) historic buildings/cultural resources 3) clean air 4) commemoration of historic events 5) clean water
2007	Rainbow Bridge National Monument	1	1) **scenic views** 2) clean water 3) untouched/undeveloped landscapes 4) clean air 5) native plants and animals
2008	Capitol Reef National Park	1	1) **scenic/natural vistas** 2) clean air 3) natural quiet/sounds of nature 4) clean water 5) solitude
2008	Carl Sandberg Home National Historic Site	3	1) clean air 2) clean water 3) **scenic views** 4) natural quiet/sounds of nature 5) native plants and wildlife
2008	City of Rocks National Reserve	2	1) clean air/visibility 2) **scenic views** 3) recreational opportunities 4) clean water 5) dark starry night sky

Table 7. Top-ranked attributes for protection from 67 studies that included questions regarding the importance of protecting scenic views (continued)

Year	NPS Unit	Scenic Views Rank	Top five ranked attributes
2008	Fire Island National Seashore	6	1) beaches and dunes 2) clean water 3) safe, crime-free environment 4) clean air 5) Island communities
2008	Grand Teton National Park	1	1) **scenic views** 2) clean air/visibility 3) opportunities to view wildlife in park ecosystem 4) clean water 5) natural quiet/sounds of nature
2008	Great Smoky Mountains National Park (fall)	1	1) **scenic views** 2) clean air/visibility 3) clean water 4) natural quiet/sounds of nature 5) animals
2008	Great Smoky Mountains National Park (spring)	1	1) **scenic views** 2) clean air/visibility 3) clean water 4) animals 5) natural quiet/sounds of nature
2008	Horseshoe Bend National Military Park	4	1) archeological & historic sites 2) clean water 3) clean air 4) **scenic views** 5) native plants
2009	Acadia National Park	3	1) clean water 2) clean air 3) **scenic views** 4) natural quiet/sounds of nature 5) native wildlife
2009	Bryce Canyon National Park	1	1) **scenic views** 2) geological formations 3) clean air 4) scenic drive 5) plants and animals
2009	Death Valley National Park	1	1) **scenic views** 2) recreational opportunities 3) clean air 4) geological features 5) natural quiet/sounds of nature
2009	Fort Larned National Historic Site	7	1) historic sites and buildings 2) repair of historic structures 3) clean water 4) clean air 5) historical scenic views
2009	Homestead National Monument of America	4	1) historic sites and buildings 2) clean water 3) clean air 4) **natural scenic views** 5) native plants
2009	Perry's Victory and International Peace Memorial	4	1) clean water 2) clean air 3) memorial 4) **scenic views** 5) historic sites & buildings
2009	Sleeping Bear Dunes National Lakeshore	3	1) clean water 2) clean air 3) **scenic views** 4) sand dunes 5) natural areas
2010	Curecanti National Recreation Area	3	1) clean water 2) clean air 3) **scenic views** 4) recreational opportunities 5) native plants and animals
2010	Delaware Water Gap National Recreation Area	6	1) clean air 2) river water with outstanding water quality 3) clean drinking water 4) recreational opportunities 5) natural quiet/sounds of nature
2010	Fort Union National Monument	4	1) historic structures 2) archaeology 3) clean air 4) **scenic views** 5) Santa Fe trail ruts
2010	Fossil Butte National Monument	5	1) fossils 2) clean water 3) clean air 4) native wildlife 5) **scenic views**
2010	Kalaupapa National Historical Park	1	1) **scenic views** 2) natural features 3) historic buildings 4) lifestyle and privacy of resident communities 5) native Hawaiian features
2010	Little River Canyon National Preserve	3	1) clean water 2) clean air 3) **scenic views** 4) natural quiet/sounds of nature 5) scenic views without development
2010	Ninety Six National Historic Site	6	1) historic structures 2) clean water 3) clean air 4) educational opportunities 5) natural quiet
2010	Niobrara National Scenic River	2	1) clean water 2) **scenic views** 3) clean air/visibility 4) recreational opportunities 5) natural quiet/sounds of nature

Regional

All seven NPS management regions had studies that asked groups to rate the importance of scenic views (Table 8). Visitor group responses across regions are very similar. Combined proportions of *extremely important* and *very important* for each region ranged from 89–94% (Figure 18) All regions had less than 3% of visitor groups indicate that scenic views were *somewhat* or *not* important (Figure 19).

The ranked importance of scenic views varied among the regions with the Midwest Region ranking it the 1st or 2nd most important criteria 33% of the time and the Pacific West Region ranking it 1st or 2nd 84% of the time (Figure 20). The Alaska Region and the National Capital Region had no 2nd most important rankings of scenic views. Individual region results are shown in Figures 21–27.

Table 8. Studies, by region, that included questions about the importance of protecting scenic views

	Number of studies	n=visitor groups
Alaska Region	2	940
Pacific West Region	12	5,311
Intermountain Region	14	6,372
Midwest Region	9	3,419
Southeast Region	19	10,343
Northeast Region	8	3,819
National Capital Region	2	1,154

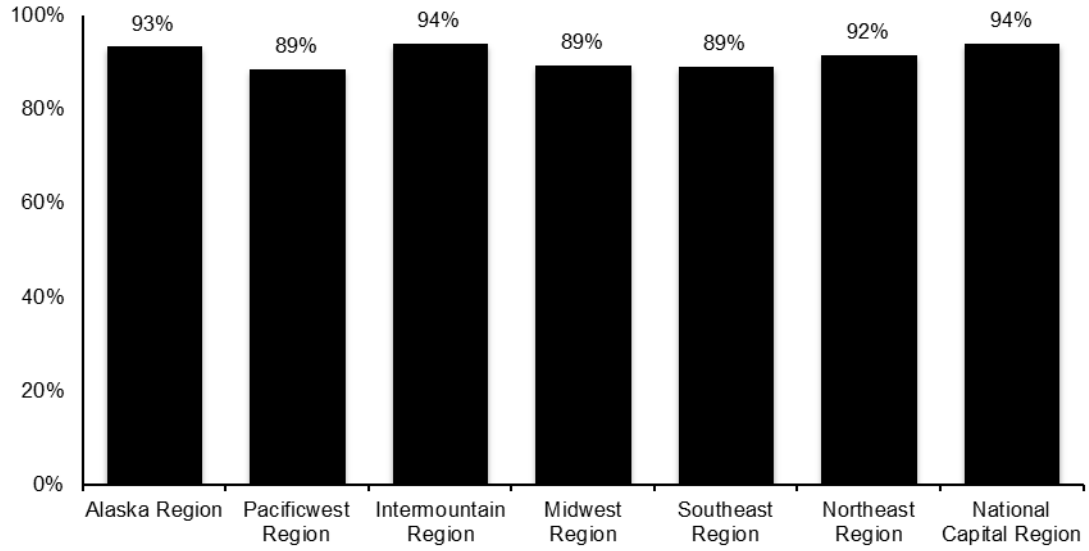


Figure 18. Regional results of scenic views rated *extremely* or *very* important

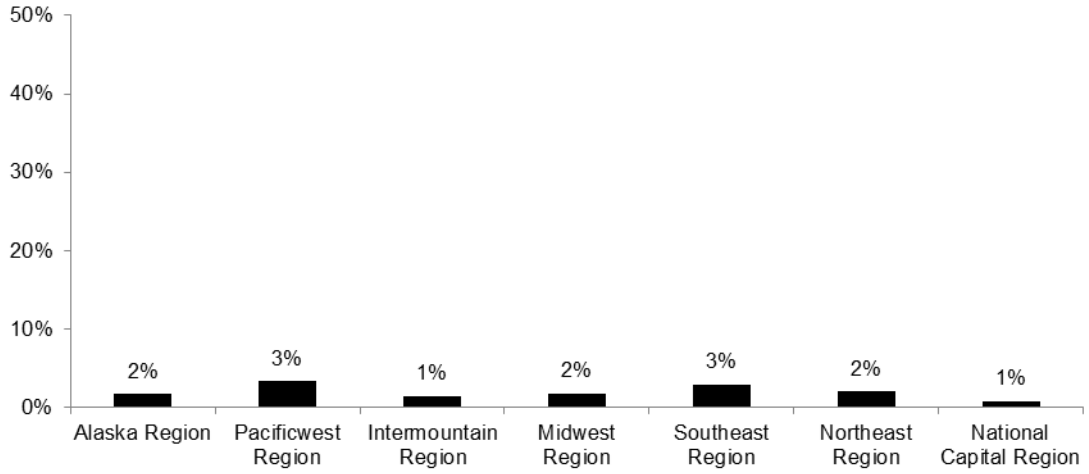


Figure 19. Regional results of scenic views rated *somewhat* or *not* important

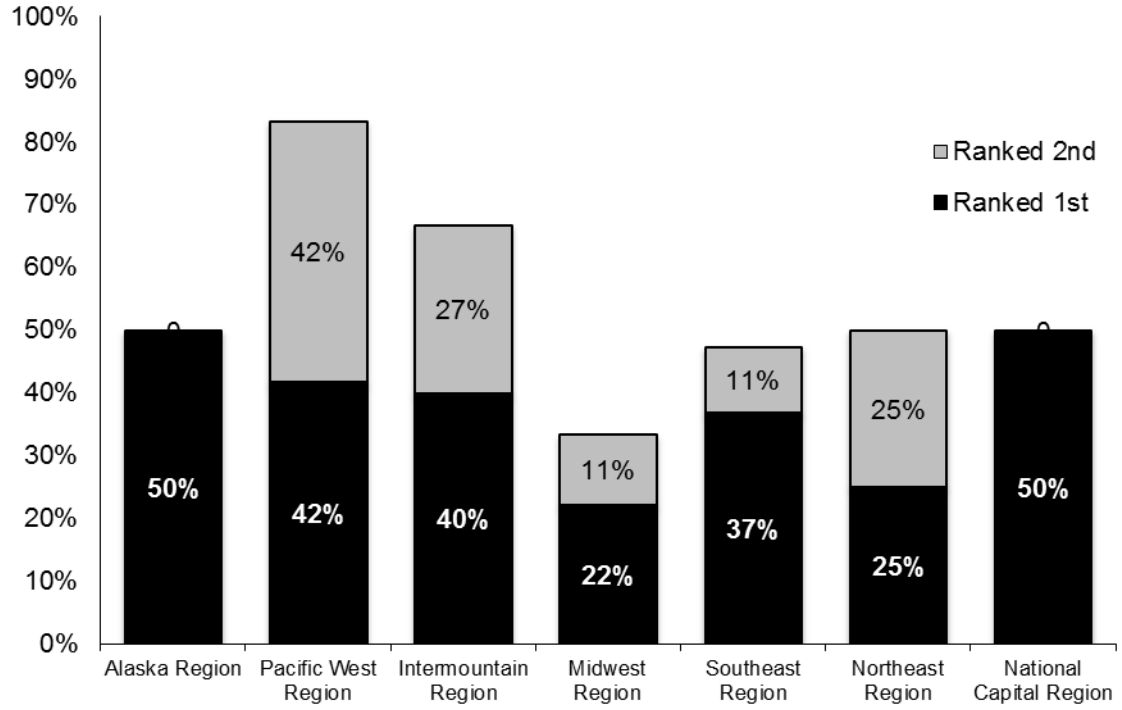


Figure 20. Percent by region that ranked scenic views as 1st or 2nd most important

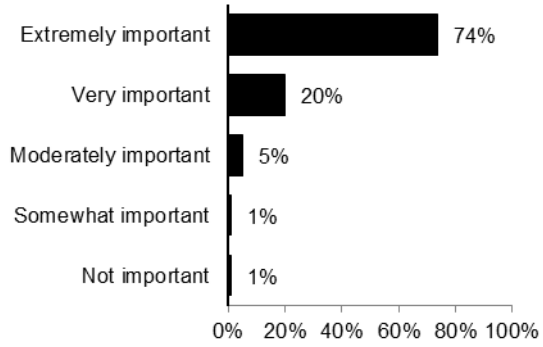


Figure 21. Alaska Region, n=940

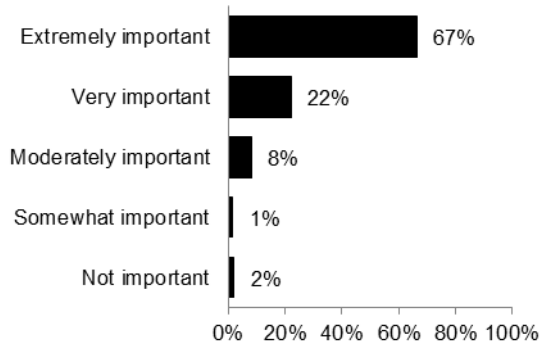


Figure 22. Pacific West Region, n=5,311

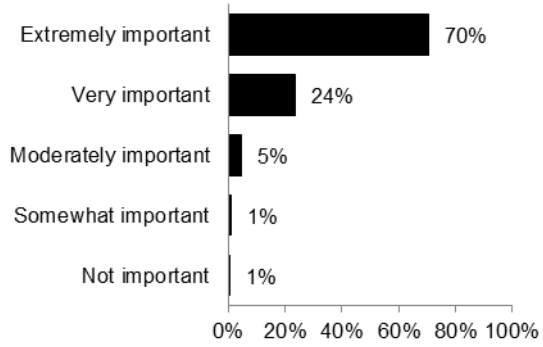


Figure 23. Intermountain Region, n=6,372

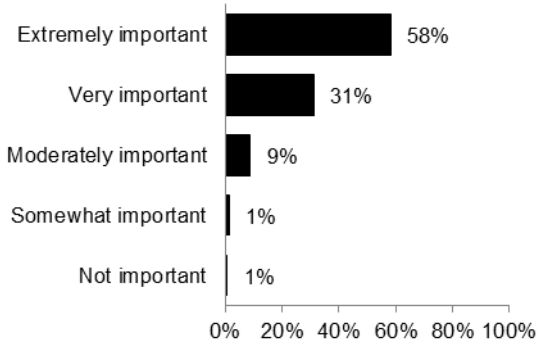


Figure 24. Midwest Region, n=3,419

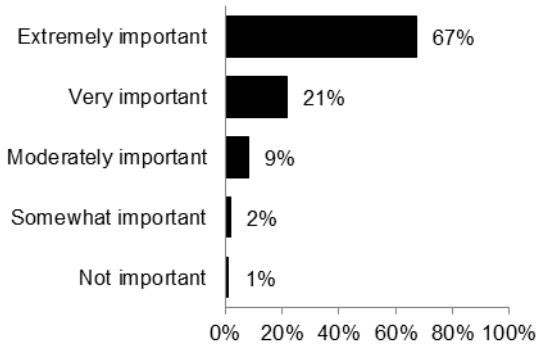


Figure 25. Southeast Region, n=10,343

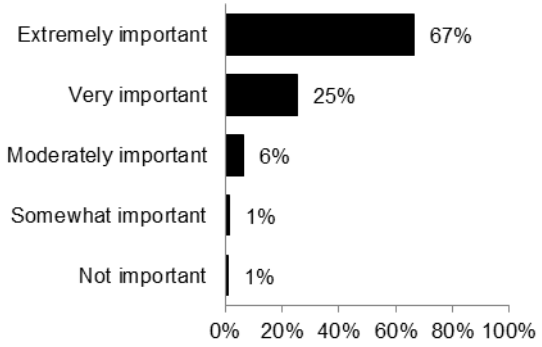


Figure 26. Northeast Region, n=3,819

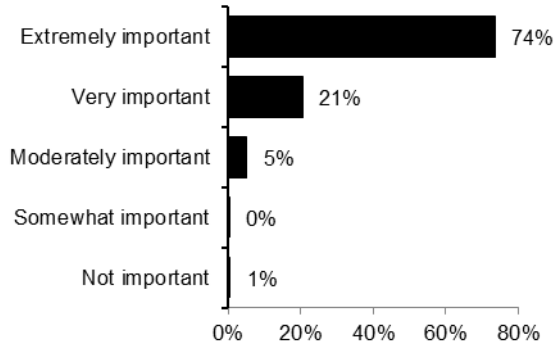


Figure 27. National Capital Region, n=1,154

Class I Air Quality Areas

Class I air quality areas have the highest level of air quality protection under the Clean Air Act. These areas are defined as national parks larger than 6,000 acres or wilderness areas over 5,000 acres that were in existence when the Clean Air Act was amended in 1977.

The NPS manages 48 national parks that have Class I air quality designation. Scenic views were rated in 17 studies from 1988–2011 in 10 NPS Class I air quality areas (Table 9). The study surveys gathered responses from 10,759 separate visitor groups (n=10,759). Results for these areas show that 95% of visitor groups felt that scenic views were either *extremely important* or *very important* (Figure 28) a higher percentage than servicewide (see Figure 16 for comparison). Only 2% of visitor groups felt that the scenic views were *somewhat important* or *not important.* Figure 29 shows that 89% of the 17 studies ranked scenic views as either 1st or 2nd most important attribute to be protected.

Table 9. Class I air quality areas in NPS units that surveyed the importance of scenic views

NPS Unit	Year
Acadia National Park	1998
Acadia National Park	2009
Bryce Canyon National Park	1997
Bryce Canyon National Park	2009
Capitol Reef National Park	2008
Craters of the Moon National Park	1988
Craters of the Moon NM & PRES	2004
Grand Teton National Park	1997
Grand Teton National Park	2008
Great Smoky Mountains National Park (fall)	1996
Great Smoky Mountains National Park (summer)	1996
Great Smoky Mountains National Park (fall)	2008
Great Smoky Mountains National Park (spring)	2008
Lassen Volcanic National Park	1999
Lava Beds National Monument	2007
Olympic National Park	2000
Pinnacles National Monument	2002

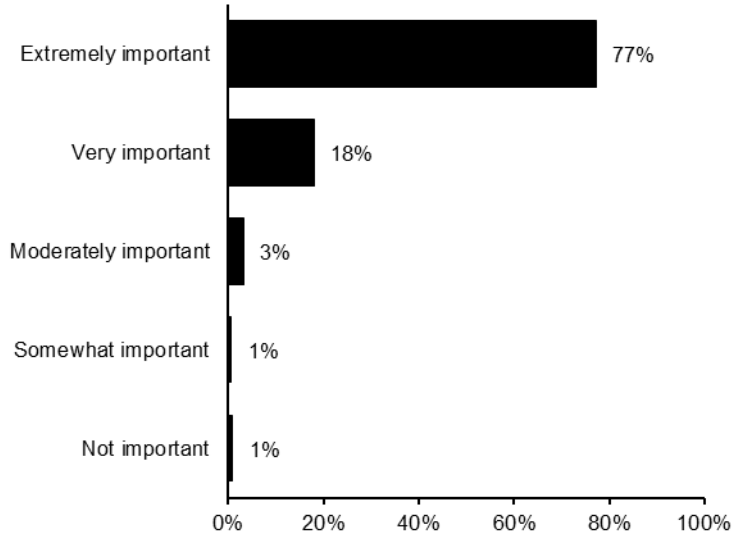


Figure 28. Importance ratings for scenic view, n=10,759 visitor groups from 17 studies in 10 Class I air quality areas from 1988–2011

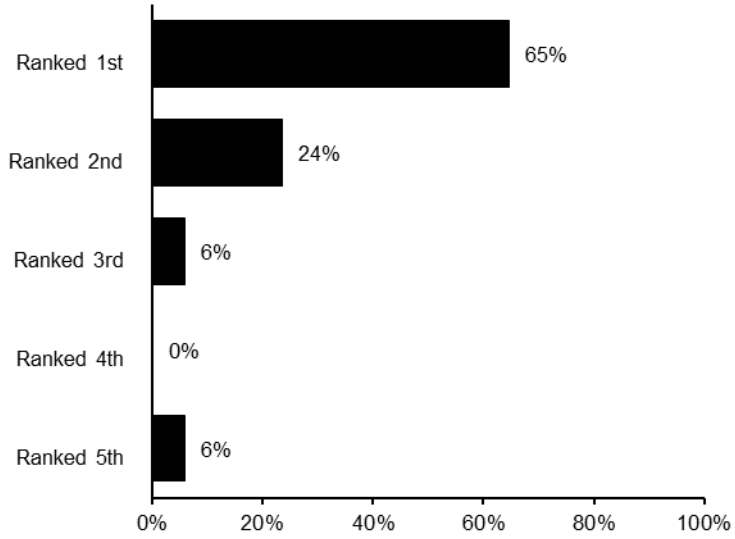


Figure 29. Ranked importance of scenic views from 17 studies in 10 Class I air quality areas

Dark Night Skies

Many visitors come to parks as some of the few remaining places to experience a dark night sky. Natural darkness is critical for nighttime scenery, such as viewing a starry sky, but also for maintaining nocturnal habitat. Many wildlife species rely on natural patterns of light and dark for navigation, to cue behaviors, or hide from predators. While 'lightscapes' can be integral to the historical context of a place, human-caused light may be considered obtrusive for various reasons. Light that is undesirable in a natural or cultural landscape is often called 'light pollution.'

Poor air quality in combination with light pollution can lead to reduced ability to see starry skies. Air pollution can dim the stars and other celestial objects slightly, but more significantly, poor air quality 'scatters' artificial light to a greater degree than clear air. This results in parks near cities and other significant light sources having greater 'sky glow' than would be perceived absent air pollution.

Servicewide

Dark night skies, as well as 6–15 other resource attributes, were rated in 41 studies conducted from 1988–2011 in 15 NPS units. The surveys gathered responses from 18,345 separate visitor groups (n=18,345). Each visitor group rated scenic views on a five point scale with 1 being *not important* and 5 being *extremely important*.

Dark night skies were *extremely important* or *very important* to 62% of visitor groups, 19% thought it was *moderately important*, and 19% responded that dark night skies were *somewhat important* or *not important* (Figure 30).

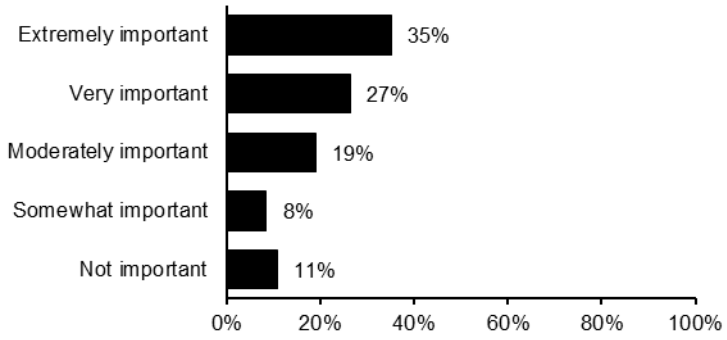


Figure 30. Importance ratings for dark night skies, n=18,345 visitor groups from 41 surveys in 15 NPS units from 1988–2011

Survey responses are analyzed based on the year the study was conducted, to see if visitor values related to dark night skies have changed over time. In this analysis responses from visitor groups are combined if they responded that dark night skies were an *extremely important* or *very important* attribute to protect. Results show that from 1988–2011, the percentage of visitor groups that placed high value on dark night skies varied between 14% and 79% (Table 10).

Table 10. Yearly percent of visitor groups that marked dark, night sky as *extremely important* or *very important*, n=18,345 visitor groups

Number of studies	Year	Extremely Important or Very Important	n=visitor groups
1	1990	14%	251
0	1991	-	0
0	1992	-	0
0	1993	-	0
0	1994	-	0
0	1995	-	0
1	1996	44%	580
1	1997	69%	443
0	1998	-	0
0	1999	-	0
1	2000	41%	487
1	2001	72%	432
4	2002	60%	1,898
3	2003	48%	1,179
3	2004	58%	1,216
0	2005	-	0
1	2006	79%	413
3	2007	74%	883
7	2008	56%	3,876
6	2009	68%	2,829
8	2010	69%	3,291
1	2011	75%	567
41		**62%**	**18,345**

Data from each visitor survey were also analyzed to determine what overall rank of importance each attribute received from the visitor group responses. Dark night skies ranged from 5th to 13th in ranking the most important attributes to protect. Figure 31 shows the percentage of each ranking for dark night skies. Dark night skies, though not the least important attribute, consistently ranked in the bottom half of important attributes to protect among visitor groups surveyed. However, there is a trend over time toward greater visitor importance, which may reflect growing awareness about the value of this resource. Table 11 shows the ranking of importance of dark night skies for each visitor study.

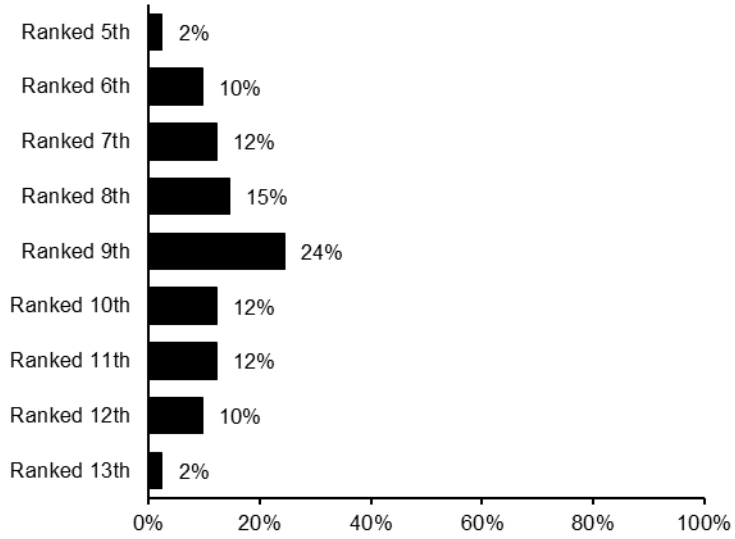


Figure 31. Ranked importance of dark night skies, n=41 studies in 15 NPS units

Table 11. Rankings of dark night skies from 41 studies in 15 NPS units

Year	NPS Unit	Dark Night Sky Rank
1990	Death Valley National Monument	8
1996	Death Valley National Park	7
1997	Mojave National Preserve	7
2000	Badlands National Park	11
2001	Crater Lake National Park	7
2002	Catoctin Mountain Park	7
2002	Outer Banks Group Parks	9
2002	Pinnacles National Monument	11
2002	Sequoia and Kings Canyon National Parks	10
2003	Arches National Park	6
2003	C&O Canal National Historical Park	13
2003	Mojave National Preserve	6
2004	Apostle Islands National Lakeshore	8
2004	Chickasaw National Recreation Area	10
2004	Craters of the Moon NM & PRES	12
2006	Mammoth Cave National Park	9
2007	Ebey's Landing National Historical Reserve	9
2007	Lava Beds National Monument	12
2007	Minute Man National Historical Park	12
2008	City of Rocks National Reserve	5
2008	Grand Teton National Park	9
2008	Great Smoky Mountains National Park (fall)	10
2008	Great Smoky Mountains National Park (spring)	10

Table 11. Rankings of dark night skies from 41 studies in 15 NPS units (continued)

Year	NPS Unit	Dark Night Sky Rank
2008	Capitol Reef National Park	11
2008	Everglades National Park (spring)	9
2008	Everglades National Park (winter)	9
2009	Acadia National Park	7
2009	Bryce Canyon National Park	9
2009	Death Valley National Park	6
2009	Homestead National Monument of America	10
2009	Fort Larned National Historic Site	11
2009	Sleeping Bear Dunes National Lakeshore	9
2010	Black Canyon of the Gunnison National Park	6
2010	Curecanti National Recreation Area	8
2010	Delaware Water Gap National Recreation Area	11
2010	Fort Union National Historic Site	12
2010	Fossil Butte National Monument	9
2010	Joshua Tree National Park	8
2010	Niobrara National Scenic River	9
2010	Rocky Mountain National Park	8
2011	Rocky Mountain National Park	8

Regional

Only 5 of the 7 NPS management regions had studies that inquired about the importance of protecting dark night skies. Table 12 shows the number of studies and the number of responses by visitor groups in each region. Combined proportions of *extremely important* and *very important* for each region ranged from 57% to 67%, as shown in Figure 32. Individual region results are shown in Figures 33 through 37.

Table 12. Studies that included dark night skies, by region.

	Number of Studies	n=visitor groups
Alaska Region	0	0
Pacific West Region	12	4,552
Intermountain Region	12	5,344
Midwest Region	6	2,400
Southeast Region	6	3,462
Northeast Region	5	2,587
National Capital Region	0	0

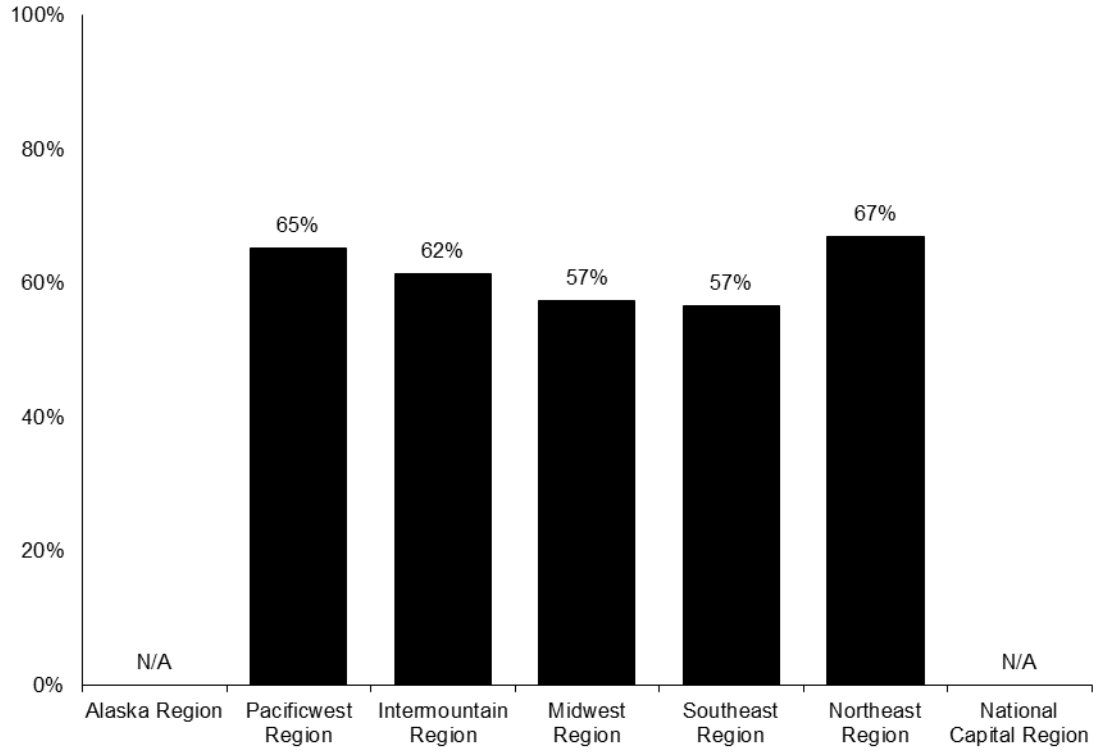


Figure 32. Regional results of dark night skies rated as *extremely* or *very* important.

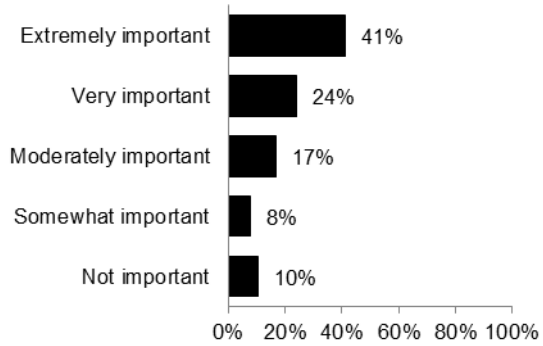


Figure 33. Pacific West Region, n=4,552

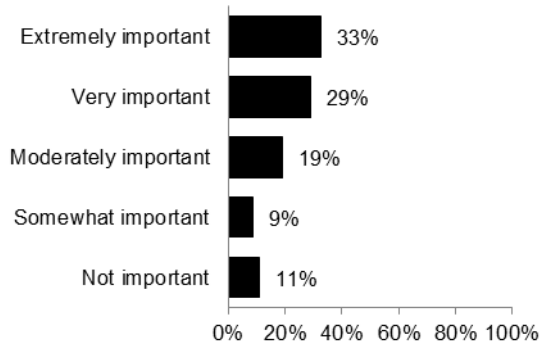


Figure 34. Intermountain Region, n=5,344

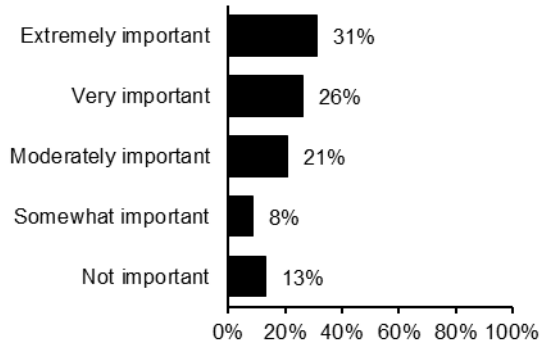


Figure 35. Midwest Region, n=2,400

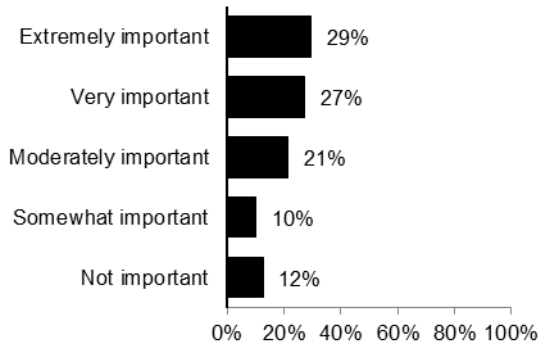


Figure 36. Southeast Region, n=3,462

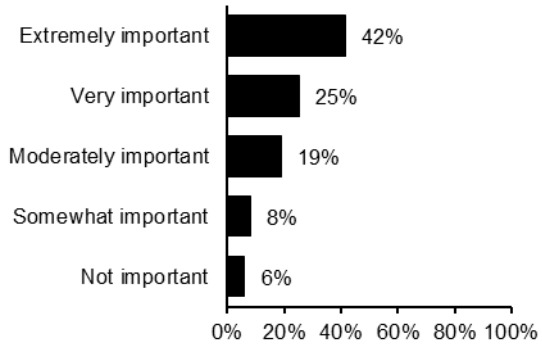


Figure 37. Northeast Region, n=2,587

Conclusions

Visitor study survey results show that visitors to NPS units throughout the country value clean air very highly. Servicewide, 88% of visitor groups surveyed considered clean air an *extremely* or *very important* resource to protect and preserve. In fact, clean air ranked as one of the top five most important attributes worthy of protection in every NPS study.

Park visitors also value scenic views very highly. Servicewide, 90% of visitor groups considered scenic views *extremely* or *very* important resource to protect and preserve. In 57% of studies that asked about scenic views, visitor groups rated scenic views as the 1st or 2nd most important resource to protect.

Clean air and scenic views consistently rank among the most valued resources in parks across the nation. This indicates that NPS visitors place a high value on these resources without regard to the type of NPS unit or whether the park is a Class I air quality area under the Clean Air Act.

Dark night skies were found to be *extremely* or *very* important to 62% of visitor groups servicewide. The percentage of visitor groups that place high value on dark skies is greater in later years than it was in the early part of the study. This could be a result of diminishing dark night skies outside parks causing visitors to value areas with exceptional star gazing more over time.

It is important to continue surveying visitors and measuring the value they place on clean air, scenic views, and dark night skies. Future work could expand on regional analyses of visitor perceptions or changing trends through time if more studies including these attributes are conducted.

The value visitors place on protecting clean air, scenic views, and dark night skies overall reveals remarkable public support for protecting these resources in the NPS, and that these resources are critical to providing for the enjoyment of current and future generations.

Appendix 1: Survey Design and Procedures

Sample size and sampling plan

All VSP questionnaires follow design principles outlined in Don A. Dillman's book Mail and Internet Surveys: The Tailored Design Method (2000). Based on this methodology, the sample size was calculated based on statistics of park visitation statistics of previous years. To minimize coverage error, the sample size was also determined to provide adequate information about specific park sites if requested.

Questionnaire design

Questionnaires are developed at workshops held with park staff to design and prioritize the questions. Some questions are standard throughout VSP studies conducted at other parks while others are customized for each park. Many questions ask visitors to choose answers from a list provided, often with an open-ended option, while others were completely open-ended. All questions followed the OMB guidelines and/or were used in previous surveys. Thus, the clarity and consistency of the survey instrument have been tested and proven.

Survey procedure

Visitor groups are greeted, briefly introduced to the purpose of the study, and asked to participate. If visitors agree, an interview lasting approximately two minutes is used to determine group size, group type, and the age of the group member (at least 16 years of age) who would complete the questionnaire. Individuals are then asked for their names, addresses, and telephone numbers in order to mail them a reminder/thank you postcard and follow-ups if needed. Visitor groups are given a questionnaire, asked to complete it after their visit, and then return it by mail. The questionnaires are pre-addressed and pre-stamped.

Two weeks following the survey, a reminder/thank you postcard is mailed to all participants. Replacement questionnaires are mailed to participants who do not return their questionnaires four weeks after the survey. Seven weeks after the survey, a second round of replacement questionnaires is mailed to visitors who still have not returned their questionnaires.

Data analysis

Returned questionnaires are coded and the information is entered into a computer using standard statistical software packages—Statistical Analysis System (SAS) or Statistical Package for the Social Sciences (SPSS). Frequency distribution and cross-tabulations are calculated for the coded data, and responses to open-ended questions are categorized and summarized.

Limitations

Like all surveys, these studies have limitations that should be considered when interpreting the results.

1. These studies are self-administered surveys. In addition, visitor groups fill out the questionnaires after the visit, which may result in poor recall of the visit details. Thus, it is not possible to know whether visitor responses reflect actual behavior.

2. The data reflect visitor use patterns to NPS units during the study periods. The results present a 'snap-shot-in-time' and do not necessarily apply to visitors during other times of the year.
3. Occasionally, there may be inconsistencies in the results. Missing data or incorrect answers may cause these inconsistencies. The visitor group may have answered some of the questions incorrectly due to carelessness, misunderstanding the directions, or inaccurate memory. Thus, sometimes it is better to refer to both the percentage and n (number of individuals or visitor groups) to interpret the result.

Questions and codes

Questions were asked to visitor groups about their perceptions on clean air, scenic views, night sky viewing and air quality while visiting the NPS unit. There were 80,088 responses to the questions about these resource attributes in a total of 91 reports at 73 different NPS units. Scenic views and vistas were thought to be relevant to this study though there may be additional meanings in the selection of this code by visitor groups. For example, visitor groups could be commenting on a specific feature located in a scenic view that they had experienced during this visit. Though such a comment is beyond the realm of this study, the ability to see scenic views and vistas while at the NPS unit applies directly to the quality and clarity of air in the area as well as the actual features viewed.

Visitor groups were asked to rate the importance of the features/resources/elements/qualities of the NPS unit. These importance questions offered visitor groups a five-point scale including a 'don't know' option. Located in the Appendix is an example VSP questionnaire. All VSP studies are located at http://www.psu.uidaho.edu/vsp.reports.htm. Example questions 1 and 2, on the following pages are the two common ways in which themes related to air quality and clean air have been asked of visitors.

Example question #1

On this trip, how important were the following to you at Joshua Tree NP? Please circle one response for each feature/quality.

	Not important	Somewhat important	Moderately important	Very important	Extremely important
Views without development	1	2	3	4	5
Natural quiet/sounds of nature	1	2	3	4	5
Solitude	1	2	3	4	5
Clean air	1	2	3	4	5
Access to rock formations	1	2	3	4	5
Access to historical/ cultural sites	1	2	3	4	5

Example question #2

Park managers are trying to provide a high quality visitor experience and protect park resources for future generations at Pinnacles NM. Please rate the importance (from 1 to 5, or DK for *don't know*) of each of the following elements/qualities to you and your group. Please circle one answer for each.

	Not important	Somewhat important	Moderately important	Very important	Extremely important
Native plants/animals	1	2	3	4	5
Scenic views	1	2	3	4	5
Clean air	1	2	3	4	5
Historic buildings	1	2	3	4	5
Archeological sites	1	2	3	4	5
Designated wilderness	1	2	3	4	5
Backcountry	1	2	3	4	5
Developed recreational facilities (trails, etc.)	1	2	3	4	5
Natural quiet/sounds of nature	1	2	3	4	5
Night sky/stargazing	1	2	3	4	5
Solitude	1	2	3	4	5
Educational programs	1	2	3	4	5
Protection of threatened and endangered species	1	2	3	4	5
Safe, crime-free environment	1	2	3	4	5

Social Science Program
National Park Service
U.S. Department of the Interior

Visitor Services Project

Capitol Reef National Park

Visitor Study

OMB Approval 1024-0224 (NPS# 08-016)
Expiration date: 11/30/2008

United States Department of the Interior

NATIONAL PARK SERVICE
Capitol Reef National Park
HC 70 Box 15
Torrey, UT 84775-9602

IN REPLY REFER TO:

May-June, 2008

Dear Visitor:

Thank you for participating in this important study. We want to learn about the expectations, opinions, and interests of visitors to Capitol Reef National Park. This information will help us improve our management of this park and better serve you, our visitor.

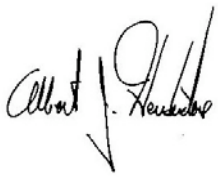
This questionnaire will be given to only a select number of visitors, so your participation is very important! It should only take about 20 minutes to complete after your visit.

When your visit is over, please complete the questionnaire. Seal it with the stickers provided on the last page and drop it in any U.S. mailbox.

If you have any questions, please contact Margaret Littlejohn, NPS VSP Director, Park Studies Unit, College of Natural Resources, P.O. Box 441139, University of Idaho, Moscow, Idaho 83844-1139, phone: 208-885-7863, email: littlej@uidaho.edu.

We appreciate your help.

Sincerely,

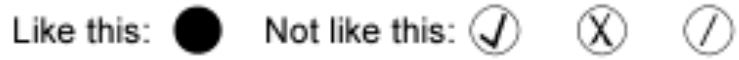


Al Hendricks
Superintendent

DIRECTIONS

At the end of your visit:

1) Please have the selected individual complete this questionnaire.
2) Answer the questions carefully since each question is different.
3) For questions that use circles (O), please mark your answer by filling in the circle with black or blue ink, or a pencil with dark (e.g. #2) lead.



4) Seal it with the stickers provided.
5) Drop it in a U.S. mailbox.

Thank you!

PRIVACY ACT and PAPERWORK REDUCTION ACT statement:

16 U.S.C. 1a-7 authorizes collection of this information. This information will be used by park managers to better serve the public. Response to this request is voluntary. No action may be taken against you for refusing to supply the information requested. Your name is requested for follow-up mailing purposes only. When analysis of the questionnaire is completed, all name and address files will be destroyed. Thus the permanent data will be anonymous. Please do not put your name or that of any member of your group on the questionnaire. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

Burden estimate statement: Public reporting burden for this form is estimated to average 20 minutes per response. Direct comments regarding the burden estimate or any other aspect of this form to Margaret Littlejohn, NPS Visitor Services Project, College of Natural Resources, University of Idaho, P.O. Box 441139, Moscow, ID, 83844-1139; email: littlej@uidaho.edu.

Your Visit To Capitol Reef National Park

NOTE: In this questionnaire, **personal group** is defined as anyone that you are visiting the park with, such as spouse, family, friends, etc. This does not include the larger group that you might be traveling with, such as school, church, scouts, or tour group.

1. Prior to your visit, were you and your group aware of the existence of Capitol Reef National Park (NP)?

   O Yes O No

2. a) Prior to your visit, how did you and your personal group obtain information to plan your visit to Capitol Reef NP? Please mark (●) **all** that apply in the left column.

   b) If you were to visit Capitol Reef NP in the future, how would you and your personal group prefer to obtain information about the park? Please mark (●) **all** that apply in the right column.

a) Prior to this visit (●)		**b) On future visits** (●)
O	Obtained no information prior to visit ➔ **Go to part b of this question**	
O	Friends/relatives/word of mouth	O
O	Travel guides/tour books (such as AAA, etc.)	O
O	Maps/brochures	O
O	Newspaper/magazine articles	O
O	E-mail/telephone/written inquiry to park	O
O	Television/radio programs/videos	O
O	Capitol Reef NP website: www.nps.gov/care/	O
O	Other websites	O
O	State welcome center/Chamber of Commerce	O
O	Highway signs	O
O	School class/program	O
O	Information from local motel or other business	O
O	Information from another national park	O
O	Other (Please specify below)	O

This visit _____ Future visits _____

c) From the sources marked above, did you and your personal group receive the type of information about the park that you needed?

O No O Yes ➔ **Go to Question 3**

↓

d) If NO, what type of park information did you and your personal group need that you did not receive? Please be specific.

_____

3. a) If you and your personal group used the park website (www.nps.gov/care/) prior to or during this visit, please rate how helpful the website was in planning your visit, by marking (●) **one** response below.

O Did not use website ➔ **Go to part b of this question**

Not at all helpful	Somewhat helpful	Moderately helpful	Very helpful	Extremely helpful
O	O	O	O	O

b) If you were to visit Capitol Reef NP in the future, what information on the park website (http://www.nps.gov/care) would you and your personal group like to have available? Please mark (●) **all** that apply.

O Not interested in using the website ➔ **Go to Question 4**

O Information to plan your visit (directions, operating hours, fees, things to do, etc.)

O Information about how to contact the park

O Schedule of events and programs

O Information about the park geology, cultural and natural history, etc.

O Other (Please specify)_____

4. For this trip, what was the **primary** reason that you and your personal group visited the **area** (within 100 miles) of Capitol Reef NP? Please mark (●) **one**.

O Resident of area

O Visit Capitol Reef NP

O Visit other attractions in the area

O Visit friends/relatives in the area

O Other (Please specify) _____

O Business

O Travel through to another destination

5. On this visit, what was the **primary** reason that you and your personal group visited Capitol Reef NP? Please mark (●) **one.**

O Take scenic drive/view scenery

O Participate in recreation (hiking, bicycling, camping, etc.)

O Fruit picking

O Study nature, including birdwatching

O Show park to friends/relatives

O Visit a National Park Service site

O Obtain stamp in National Park Passport book

O Travel through to other destination

O Other (Please specify) _____

6. a) For this visit, please mark all of the sites that you and your personal group visited in Capitol Reef NP. Please mark (●) **all** that apply.

O Scenic drive

O Visitor center

O Gifford Farmhouse

O Cathedral Valley

O Ripple Rock Nature Center

O Historic Fruita Schoolhouse

O Petroglyph panel (Hwy 24)

O Blacksmith shop

O Behunin Cabin

O Panorama Point/Goosenecks Overlook

O Notom/Burr Trail Road

O South Draw

O Fruita Historic District

O Orchards

O Campground

O Picnic area

O Other (Please specify) _____

b) Which site did you visit first?_____

7. a) On this trip, how much time did you and your personal group spend outside the park, but in the **area (**within 100 miles**)**?

_____ Number of hours **if less than 24 hours** (e.g. ¼ hr, 1 ½ hrs, 2 hrs)

_____ Number of days **if 24 hours or more** (e.g. 1 day, 1 ¼ day, 2 ½ days)

b) On this visit to Capitol Reef NP, how long did you and your personal group spend visiting the park?

_____ Number of hours **if less than 24 hours**

_____ Number of days **if 24 hours or more**

8. a) While planning this visit, what activities did you and your personal group expect to do at Capitol Reef NP? Please mark (●) **all** that apply.

b) During this visit to Capitol Reef NP, what activities did you and your personal group participate in? Please mark (●) **all** that apply.

a) Expected activities		**b) Activities participated in**
O	Attending ranger-led programs	O
O	Backpacking	O
O	Bicycling	O
O	Enjoying nature, including birdwatching	O
O	Exploring backcountry roads	O
O	Hiking	O
O	Picking fruit	O
O	Picnicking	O
O	Star gazing/viewing night skies	O
O	Taking photographs/painting/drawing	O
O	Visiting historic sites/areas	O
O	Viewing scenery	O
O	Visiting prehistoric sites (such as petroglyphs)	O
O	Other (Please specify below)	O

Expected _____ Participated in _____

c) Which **one** of the above activities was the **primary** activity that you and your personal group did in Capitol Reef NP on this visit? Please list **one** answer.

_____

9. a) On this trip, did you and your personal group stay overnight **away from home** within 100 miles of the park?

O Yes O No ➔ **Go to Question 10**

↓

b) and c) If YES, how many nights did you and your personal group spend in the following types of accommodations? Please write the number of nights stayed.

b) Number of nights inside park		**c) Number of nights outside park within 100 miles**
n/a	Lodge, motel, cabin, rented condo/home, or bed & breakfast	_____
_____	Camping in developed campground	_____
	↘ (Specify the camping location in the park: _____)	
_____	Backcountry campsite	_____
_____	Personal seasonal residence	_____
_____	Residence of friends or relatives	_____
_____	Other (Please specify below)	_____
Inside _____		Outside _____

10. a) On this trip, where did you and your personal group stay on the night prior to visiting Capitol Reef NP? If you stayed at home, please write the name of the town and state where you live.

Town/city _____ State _____

b) On this trip, where did you and your personal group stay on the night after leaving Capitol Reef NP? If you stayed at home please write the name of the town and state where you live.

Town/city _____ State _____

11. Capitol Reef NP interpretive programs and exhibits discuss topics such as: geology, American Indian culture/history, pioneer history, historic orchards, and plants/animals.

a) On this visit to Capitol Reef NP, did you and your group attend any ranger-led programs/activities?

O Yes O No ➔ b) If NO, why not?_____

_____

c) If you visit Capitol Reef NP in the future, would you and your personal group be interested in attending ranger-led programs in the park?

O Yes, likely O No, unlikely O Not sure

d) If YES to Question 11c, what length of program would you and your personal group like to attend?

O Under 1/2 hour O 1/2 - 1 hour O 1 - 2 hours

O Other (Please specify)_____

e) If YES to Question 11c, please indicate your preferred times to attend such activities at Capitol Reef NP. Please suggest **two** time periods by writing in the hours and circling a.m. or p.m.

From _____ a.m. or p.m. To _____ a.m. or p.m.

From _____ a.m. or p.m. To _____ a.m. or p.m.

f) If YES to Question 11c, would you like to have ranger-led program times advertised on the park website?

O Yes O No

12. a) Did you learn about the following topics during your visit? Please mark (●) **yes or no** for each item.

b) For each topic you answered YES to in Question 12a, please indicate to what extent, if any, your understanding of the topic improved during your visit.

c) Next, whether or not you learned about a topic on this visit, mark (●) which topics you would be interested in learning about on a future visit.

a) Learned on this visit?			**b) Improvement in understanding?**				**c) Interested on future visit?**	
(●) Yes	(●) No	**Topic**	Not at all	A little	Somewhat	A lot	(●) Yes	(●) No
O	O	Geology	O	O	O	O	O	O
O	O	American Indian culture/history	O	O	O	O	O	O
O	O	Pioneer history/ orchards	O	O	O	O	O	O
O	O	Plant life	O	O	O	O	O	O
O	O	Animal life	O	O	O	O	O	O
O	O	Ecosystems	O	O	O	O	O	O

d) Please list any additional topics you and your personal group are interested in learning about Capitol Reef NP.

_____

13. a) On this visit, did you and your personal group visit the park bookstore?

O Yes O No ➔ **Go to Question 14**

b) If YES, were you able to find the sales items you and your personal group were interested in?

O Yes O No

c) If NO, what sales items would you like to have provided?_____

_____

d) Please rate the quality of books and other sales items in the park bookstore.

Very poor	Poor	Average	Good	Very good
O	O	O	O	O

14. On this visit, how important were the following attributes/resources to you? Please mark (●) one answer for each resource.

Attribute/resource	Not important	Somewhat important	Moderately important	Very important	Extremely important
Scenic/natural vistas	O	O	O	O	O
Historic/cultural sites	O	O	O	O	O
Orchards	O	O	O	O	O
Prehistoric sites, such as petroglyphs	O	O	O	O	O
Clean water	O	O	O	O	O
Clean air	O	O	O	O	O
Solitude	O	O	O	O	O
Natural quiet/sounds of nature	O	O	O	O	O
Native plants	O	O	O	O	O
Native animals	O	O	O	O	O
Ecosystems	O	O	O	O	O
Dark, starry night skies	O	O	O	O	O

15. a) Please mark (●) **all** information services and facilities that you or your personal group **used** in Capitol Reef NP during this visit.

b) Next, for only those services and facilities that you or your personal group **used**, please rate their importance to your visit from 1-5.

c) Finally, for only those services and facilities that you or your personal group **used**, please rate their quality from 1-5.

a) Visitor services and facilities used Mark (●)		**b) If used, how important?** 1=Not important 2=Somewhat important 3=Moderately important 4=Very important 5=Extremely important	**c) If used, what quality?** 1=Very poor 2=Poor 3=Average 4=Good 5=Very good
O	Official park brochure/map	_____	_____
O	Exhibits at visitor center	_____	_____
O	Video program at visitor center	_____	_____
O	Other park publications/site bulletins	_____	_____
O	Assistance from park staff	_____	_____
O	Exhibits at Ripple Rock Nature Center	_____	_____
O	Ranger-led programs	_____	_____
O	Junior Ranger program	_____	_____
O	Exhibits at Gifford House	_____	_____
O	Self-guided nature trails	_____	_____
O	CD: “A Self-Guided Driving Tour”	_____	_____
O	Roadside exhibits	_____	_____
O	Bulletin boards	_____	_____
O	Telephone inquiries/hotlines used before or during visit	_____	_____

d) If you and your personal group have comments on any of the above services and facilities, please use the lines below.

Service/facility (List) **Comment** (Please be specific)

_____ _____

_____ _____

16. a) Please mark (●) **all** visitor services and facilities that you or your personal group **used** in Capitol Reef NP during this visit.

b) Next, for only those services and facilities that you or your personal group **used**, please rate their importance to your visit from 1-5.

c) Finally, for only those services and facilities that you or your personal group **used**, please rate their quality from 1-5.

a) Visitor services and facilities used Mark (●)		**b) If used, how important?** 1=Not important 2=Somewhat important 3=Moderately important 4=Very important 5=Extremely important	**c) If used, what quality?** 1=Very poor 2=Poor 3=Average 4=Good 5=Very good
O	Trails	_____	_____
O	Roads	_____	_____
O	Restrooms	_____	_____
O	Campgrounds	_____	_____
O	Picnic areas	_____	_____
O	Parking areas	_____	_____
O	Access for disabled persons	_____	_____
O	Recycling	_____	_____
O	Trash cans/dumpsters	_____	_____
O	Drinking water	_____	_____
O	RV dump station	_____	_____
O	Park directional signs	_____	_____

d) If you and your personal group have comments about any of the above services and facilities, please use the lines below.

Service/facility (List) **Comment** (Please be specific)

_____ _____

_____ _____

17. For you and your personal group, please list all expenditures for the items listed below during this visit to Capitol Reef NP and the surrounding area (within 100 miles). **Please write "0" if no money was spent in a particular category.**

a) Please list your personal group's total expenditures inside Capitol Reef NP.

b) Please list your personal group's total expenditures in the **area outside** the park (within 100 miles).

NOTE: Area residents should only include expenditures that were **directly related** to this visit to Capitol Reef NP.

	EXPENDITURES	
	a) Inside Capitol Reef NP	**b) In surrounding area outside park**
Lodge/hotel/motel/bed & breakfast/cabins	n/a	$_____
Camping fees and charges	$_____	$_____
Restaurants and bars	n/a	$_____
Groceries and takeout food	$_____	$_____
Gas and oil (auto, RV, boat, etc.)	n/a	$_____
Fishing/boating/kayaking	$_____	$_____
Trail rides/guided tours	$_____	$_____
Other transportation expenses (rental cars, auto repair, etc.)	$_____	$_____
Admission, recreation, entertainment fees	$_____	$_____
All other purchases (souvenirs, books, sporting goods, clothing, etc.)	$_____	$_____

c) How many people do the above expenses cover?

_____ Adults (18 years or over) _____ Children (under 18 years)

Please write "0" if the expenditures did not include any children.

18. Units of the National Park System are established to preserve places with outstanding natural and cultural resources and to provide ways for visitors to enjoy these resources.

a) In your opinion, how important is conducting scientific research about natural and cultural resources in national parks?

	Not important	Somewhat important	Moderately important	Very important	Extremely important
Science/research—scientific study of park resources	O	O	O	O	O

b) Do you think conducting scientific research about natural and cultural resources is a valuable use of public land?

O Yes O No

c) Are you and your personal group interested in learning about the latest research that is being conducted in national park units?

O Yes O No ➔ **Go to Question 19**

d) If YES, how would you like to learn this information? For example, website, brochure, exhibit, etc.

_____

19. On this trip were you and your personal group with the following groups?

a) Commercial guided tour group O Yes O No

b) School/educational group O Yes O No

c) Other organized group (such as business group, scout group, etc.) O Yes O No

20. On this visit, what kind of personal group were you with? Please mark (●) **one**.

O Alone O Friends

O Family O Family and friends

O Other (Please specify) _____

21. a) On this visit, how many people were in your personal group, including yourself?

_____ Number of people

b) On this visit, please list the number of vehicles in which you and your personal group arrived at the park.

_____ Number of vehicles

c) On this trip, how many times did you and your personal group enter Capitol Reef NP?

_____ Number of times entered

22. a) When visiting an area such as Capitol Reef NP, what **one** language do you and most members of your personal group prefer to use for the following?

Speaking **Reading**

_____ _____

b) What **services** in the park would you like to have provided in languages other than English? Please specify a **service** or mark (●) "None."

Services:_____ O None

23. For you and your personal group on this visit, please provide the following. (If you do not know the answer, leave blank).

	a) Current age	**b) U.S. ZIP code or name of country other than U.S.**	**c) Number of visits to Capitol Reef NP** (including this visit) **lifetime**
Yourself	_____	_____	_____
Member #2	_____	_____	_____
Member #3	_____	_____	_____
Member #4	_____	_____	_____
Member #5	_____	_____	_____
Member #6	_____	_____	_____
Member #7	_____	_____	_____

24. a) Does anyone in your personal group have a physical condition that could make it difficult to access or participate in park activities or services?

O Yes ↓ O No ➔ **Go to Question 25**

b) If YES, were there services or activities that were difficult to access/participate in? Please be specific.

_____

_____

25. Is there anything else you and your personal group would like to tell us about your visit to Capitol Reef NP?

_____

_____

_____

_____

26. Overall, how would you rate the quality of the visitor facilities, services, and recreational opportunities provided to you and your personal group at Capitol Reef NP during this visit? Please mark (●) **one**.

Very poor	Poor	Average	Good	Very good
O	O	O	O	O

Thank you for your help! Please seal the questionnaire with the stickers provided and drop it in any U.S. mailbox.

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