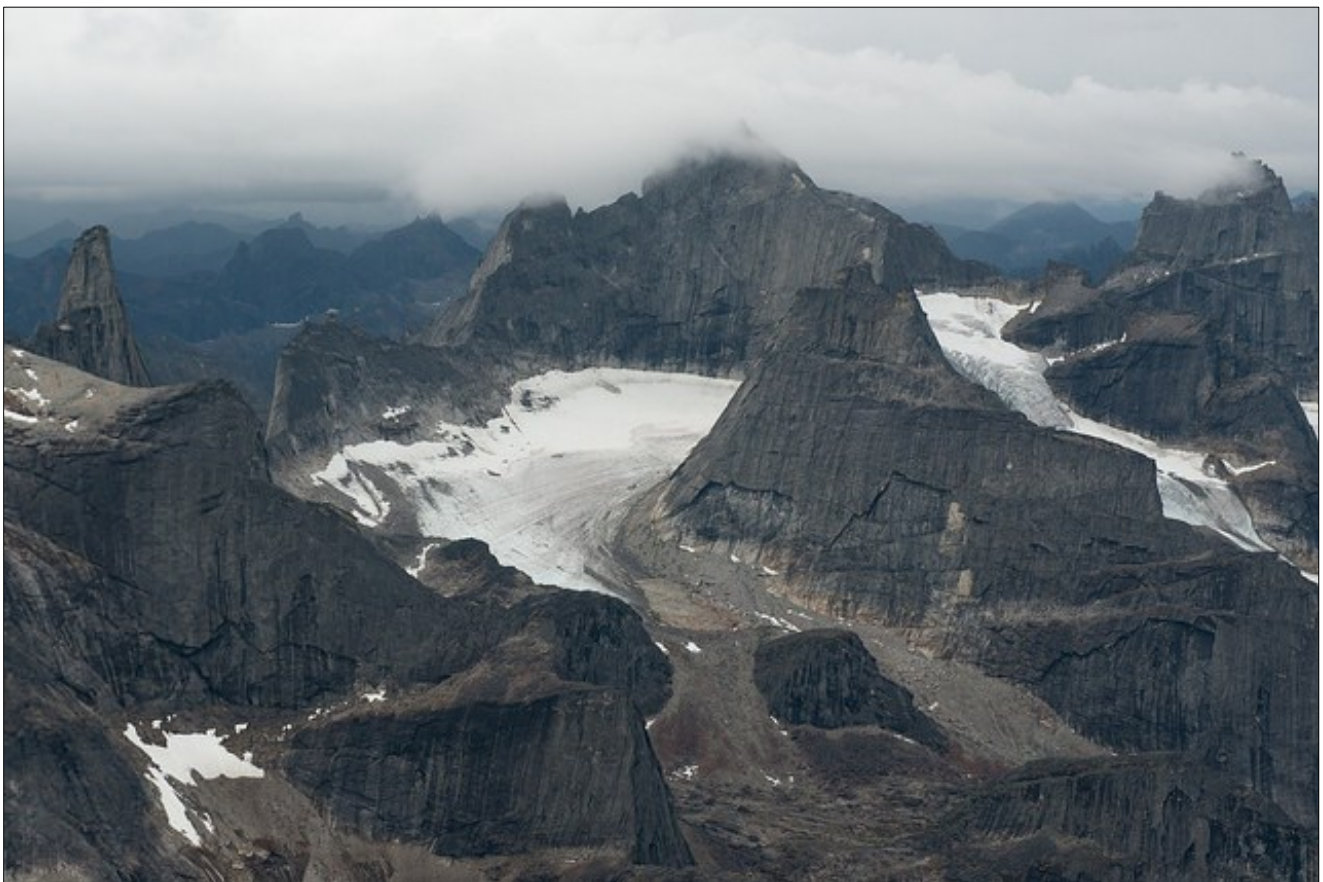




Backcountry Use Impacts and Media Coverage in Gates of the Arctic National Park and Preserve, Alaska

Natural Resource Report NPS/GAAR/NRR—2017/1444



ON THE COVER

Arrigetch Peaks, Gates of the Arctic National Park and Preserve
NPS/Sean Tevebaugh

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May 2017

U.S. Department of the Interior
National Park Service
Natural Resource Stewardship and Science
Fort Collins, Colorado

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Please cite this publication as:

Sigg, C. 2017. Backcountry use impacts and media coverage in Gates of the Arctic National Park and Preserve, Alaska. Natural Resource Report NPS/GAAR/NRR—2017/1444. National Park Service, Fort Collins, Colorado.

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Abstract

Gates of the Arctic National Park and Preserve (NPP) is the northernmost park unit in the United States. It lies entirely above the Arctic Circle and is home to many slow-growing plants and lichens. This fragile ecosystem can easily be disturbed by the recreational backcountry use of park visitors, especially if use is concentrated in certain areas. The creation of trails, fire rings, human waste, and other human impacts detract from the wilderness experience the park was created to preserve. Using geographic information systems (GIS), I developed a map showing correlations between recreational backcountry impacts and areas of the park featured in popular outdoor magazines and blogs. Park data on impacted sites and management zones was obtained from the National Park Service (NPS). Data concerning areas of the park featured in the media was created by compiling Google search results for “Gates of the Arctic National Park” and adding new fields to the park management zone GIS layer. The intersect geoprocessing tool was used to show which impact sites fell into management zones featured in blogs or magazines. Overall, a majority of the impact sites were located in management zones that were recommended by blogs and magazines as places to visit. The overwhelming concentration of impact sites in these featured zones indicates blogs and magazines have a strong influence in determining where backcountry users plan trips in Gates of the Arctic NPP. The map has practical applications for the NPS in deciding where to allocate resources to prevent recreational impacts and to rehabilitate areas damaged by recreational use.

Acknowledgments

I thank the Alaska Regional Office of the National Park Service for responding to my initial request for GIS data on park visitation. Also, I thank the staff of Gates of the Arctic National Park and Preserve, especially Andy Baltensperger, for providing park data and encouraging my progress while completing the project. Lastly, I thank my GIS course instructor at Front Range Community College, Jennifer Mula, for the GIS skills learned while taking her class.

Introduction

Gates of the Arctic National Park and Preserve (NPP) lies in Alaska's Brooks Range. The park is a congressionally designated Wilderness Area, but it is one of the few true wilderness parks in the U.S. With 7 million acres of designated wilderness, Gates of the Arctic is part of a larger system of 21 million acres of wilderness in arctic Alaska managed as either National Parks or National Wildlife Refuges. Gates of the Arctic NPP also hosts six designated wild and scenic rivers. There are no established roads or trails inside the park. The Alaska National Interest Lands Conservation Act (ANILCA), passed in 1980 by President Jimmy Carter, states that the park shall be managed "To maintain the wild and undeveloped character of the area, including opportunities for visitors to experience solitude, and the natural environmental integrity and scenic beauty of the mountains, forelands, rivers, lakes, and other natural features."

The remoteness and limited access make Gates of the Arctic NPP one of the least-visited units in the National Park system, although visitation has been increasing in the last two decades (National Park Service 2014). Increased visitation is generally welcomed by the National Park Service and rural Alaskan economies, however a concentration of visitors to certain areas in the park is a cause for concern. The promotion of backcountry use through blogs and outdoor magazines has brought attention to areas of the park that in the past may not have seen many visitors. The recent rise in popularity of packrafting, which was largely invented to traverse rivers in the Brooks Range, has allowed more people to gain better access to new regions of the park.

National Park Service (NPS) managers are interested in determining which areas of the park receive the greatest concentration of backcountry traffic. This is due to the impact that backcountry activities such as hiking, camping, climbing, and rafting can have on fragile arctic ecosystems. For example, much of the park is above latitudinal tree-line and it can take hundreds of years for lichen to regenerate following a disturbance. Nonvascular plants comprise more than 50 percent of the biomass in arctic tundra ecosystems and human disturbance can easily damage these plants (Walton and Stehn 2014). The unintended consequence of many backcountry users is that their visitation can cause visible damage to the landscape that degrades wilderness character, even if they practice Leave No Trace ethics. In some popular areas, social trails and over-used campsites already are evident.

The limited access available to visitors makes selecting an area to visit a challenge for potential visitors as there is also limited information on reaching remote areas. Over the past few years, the internet has provided information to fill this void. Sites such as *reddit.com* and magazines like *Outside* and *Backpacker* show photos and provide descriptions of some of the park's most scenic areas to visitors unfamiliar with Arctic Alaska. While these media sources encourage visitation to the park, the areas featured may become at risk of wilderness degradation as a result. Using ArcGIS 10.3 (ESRI Inc., Redlands, CA), I analyzed whether the sites in the park already impacted by recreational use are correlated to areas featured in the media. I created a map displaying this correlation, which efficiently depicts the trend between digital media features of Gates of the Arctic NPP and backcountry, recreational use and impacted sites. The map can be used by the NPS as a tool to identify where to dedicate rehabilitation work and to predict where future impacted sites may occur.

Methods

I retrieved most necessary datasets from the NPS Data Store including a digital elevation model (DEM) raster file of the Central Brooks Range and a polygon layer of the backcountry management zones in the park. A point layer depicting impact sites in the park, derived from the NPS backcountry patrol database, detailed locations of trails, fire rings, campsites, and human waste. These points were gathered in the field by backcountry rangers between 2006 and 2011.

Prominent natural features in the park such as rivers, mountains, and passes were included to bring context to the map. The Dalton Highway, near the park's eastern border, was also included because it is a popular park access site. Many people use the highway to hike a distance of 1-5 miles into the park. These features were digitized and names were added to each feature's attribute table. Before digitization was completed, a .PNG file of the park map included in the park brochure was georeferenced to ensure the digitized features were accurate.

Data on park features in the media was acquired by Google search using the terms "Gates of the Arctic National Park" and "Gates of the Arctic National Park trips." Each time an area of the park was mentioned on a webpage found using a Google search, the website source and featured area of the park were recorded. This method resulted in a list tallying the featured areas of the park and the corresponding media source. Popular outdoor magazines not shown in Google searches were also included. The magazines included in the study were *Climbing*, *Outside*, and *Backpacker*. Other key media outlets included were *reddit.com* that featured many trip reports and the blog of Alaska Pacific University professor and renowned packraft enthusiast, Roman Dial. The tallied list of park mentions compiled from media references were organized and assigned to the management zones attribute table. New text fields were created and named "Featured," "Featured_No," and "Media_Nam." Management zones were recorded as either "Yes" or "No" depending on whether the zone was mentioned by the media. "Feature_No" indicated how many times an area of the park was mentioned in a blog or magazine. Lastly, this field was symbolized using a red color ramp with dark red showing the highest number of mentions. The resulting colored management zones were set to 35% transparency in order to display the topographic relief of the DEM.

The NPS data on impact sites was filtered to yield only sites that related to backcountry recreational use. I removed numerous sites in this layer that were attributed to industrial impacts and subsistence activities by Alaska residents such as trapping. Nevertheless, some impacts in this assessment, especially near Chandler Lake, may be more related to subsistence uses than recreational activities. Records were filtered using the select by attribute tool and an SQL query. Numerous points on the impact site point layer were also located outside of the park; these points were excluded from the analysis using the clip tool. A new set of filtered records was then exported to a new layer. The input features were the impact sites and the backcountry management zones layer. A new clipped layer showing the sites within the park boundary was created as the output.

The main analysis for this project was completed using the intersect tool, which determined how many impact sites were located in management zones featured in the media. The input layer was a newly created layer of the management zones containing "Yes" in the "Featured" attribute field,

designating each zone featured by a media source. The second input layer was the clipped impact sites layer. The resulting layer created by the tool showed all impact sites within management zones featured by the media. All layers were in the NAD 1983, 2011 Alaska Albers data projection. A conformal projection was selected because it preserved shape and distance. These two elements allowed for accurate displays of both the distance between impact sites and the topographic relief of the Brooks Range.

Results

A total of 369 impacted sites derived from the NPS backcountry patrol database were located within the park (Figure 1). Of these, 312 sites were located in management zones featured by blogs, magazines, or other digital media. Parkwide, 17 of 32 backcountry management zones were featured in the media. The areas of the park with the highest concentrations of backcountry recreational impacted sites included: Arrigetch Peaks, Noatak River, and Chandler Lake. All three areas are located within management zones featured in the media. Six management zones had no documented backcountry impacted sites and these zones were also not featured by any media sources (Figure 1).

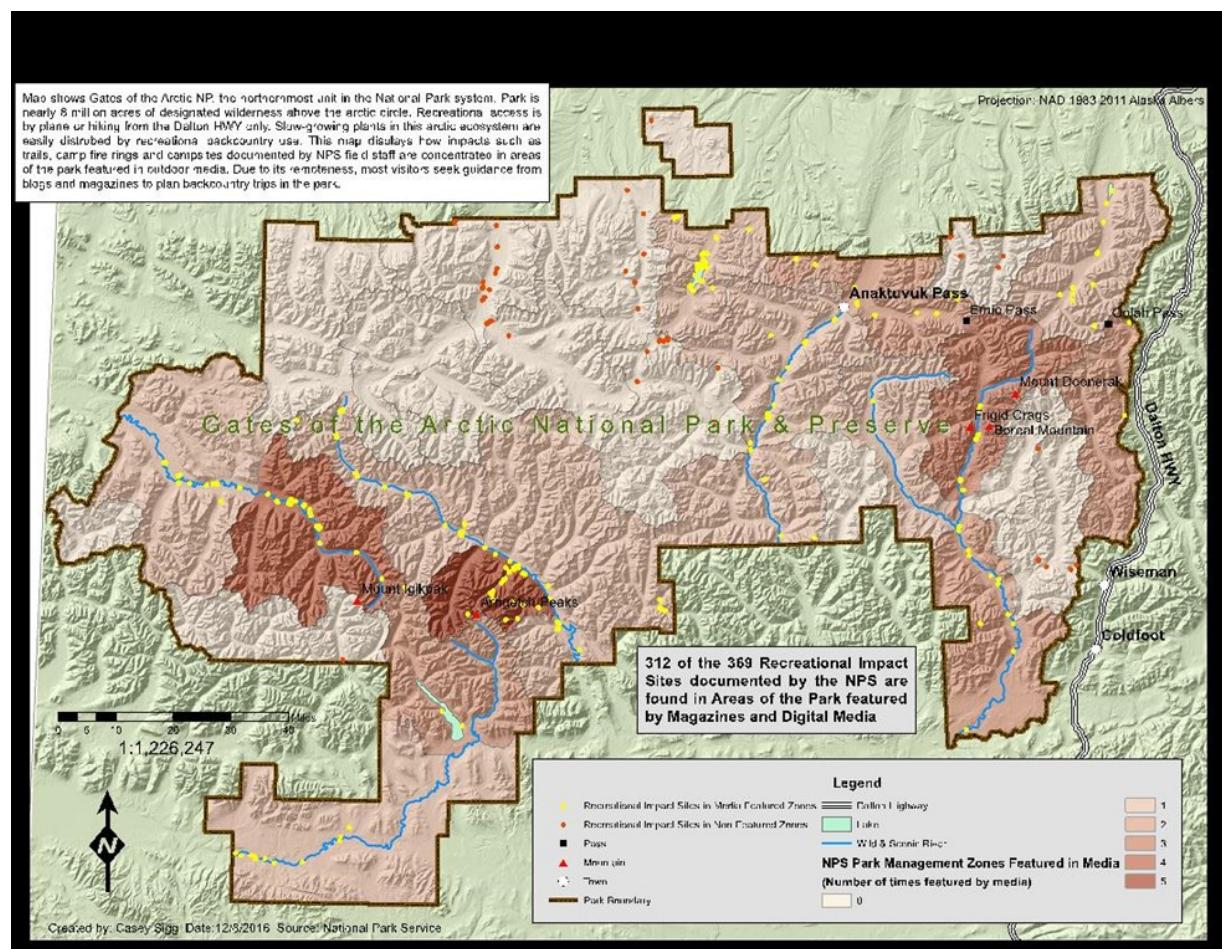


Figure 1. Backcountry use impacts in Gates of the Arctic NP&P, Alaska. Map shows the correlation between backcountry recreational impacted sites and areas of the park featured by blogs and magazines.

The management zone featured most frequently by the media was the Arrigetch Peaks zone with five mentions (Table 1). Other zones with frequent mentions (n=4) included the Eastern Noatak River and Upper North Fork of the Koyukuk River. The zone containing the Killik River had the highest number of backcountry recreational impacted sites in a zone not featured by the media. Within zones featured by the media, the largest concentration of backcountry, recreational, impacted sites were located along waterways and an overwhelming majority of sites were located along drainages of wild and scenic rivers.

Table 1. The number of media features in relation to number of impact sites for each Backcountry Management Zone that received media coverage in Gates of the Arctic National Park and Preserve.

Backcountry Management Zone	Number of Media Features	Number of Impact Sites
Arrigetch Peaks	5	62
Upper Noatak River	4	50
Upper North Fork Koyukuk River	4	1
Lower North Fork Koyukuk River	3	20
Anaktuvuk Pass	3	12
Hammond River	3	2
Walker Lake	2	4
Itkillik River	1	16
Kobuk Preserve Unit	1	13
Lower Noatak River	1	14
Tinayguk River	1	1
Upper John River	1	26
Lower John River	1	5
Chandler Lake	1	82
Lower Alatna River	1	18
Upper Alatna River	1	28
Middle Alatna River	1	9

Discussion

The majority of recreational impacted sites located in media-featured areas indicates that digital media has a strong influence on recreational use in Gates of the Arctic NPP. Digital media has changed how people consume information. In the past, a potential backcountry visitor may have discussed trip planning at length with park staff or had a specific trip recommended by a friend. Although the ease of finding information through digital media has become a more powerful force, the ability to upload images and video of scenic areas in the park may provide a more effective means of attracting interest to certain areas. Potential visitors no longer need to rely on printed media to make decisions on trip planning in national parks.

It is not surprising the Arrigetch Peaks area had more features by media than any other park management zone. This area has long been considered by the media and Alaskans as one of the most scenic areas in the state. The needle-like granite spires of the Arrigetch Peaks have been an international climbing destination since the 1960s. An idea for future research could document the number of times the park was featured in print media before the internet.

The concentration of impacted sites along rivers and lakes indicate that these waterways are a draw for visitors. The frequent mention by the media and the NPS of the six designated wild and scenic rivers and of rafting as a means to explore the park support this result. Furthermore, the gravel bars of rivers and open water of lakes are easy places for planes to land, providing the primary means of entering the park. The determination of backcountry recreational use impacted sites from other human use impacts sites could be a source of error in this study. It is possible that some sites documented in the field such as human waste or campfire rings may have resulted from subsistence activities or other non-recreational activities.

Conclusions

This map can be an effective aid for determining habitat restoration strategies park wide. The heavy concentrations of backcountry recreational use impacted sites can be compared with plant inventories to achieve this. The map also allows managers to identify places that may be experiencing the greatest amount of stress from recreational activities and speculate on the role that media has on visitation. The concentration of impacted sites in the Arrigetch Peaks zone correlates with the high number of media features that mention this area, suggesting that media is strongly influencing visitation to this zone. Media sources that display photos of the most scenic areas of the park likely have a compelling influence on where backcountry trips are planned.

While the map shows a clear trend between areas featured by media and backcountry recreational impact sites, it is likely that media is not the sole cause for the concentrations of these sites throughout the park. Media, particularly blogs and magazines, is part of a larger set of factors that influence where visitors decide to recreate in Gates of the Arctic NPP. These additional factors may include: commercial guides, air taxi services and contacts with park staff. But media, with its ability to reach a wide public audience, can be an important indicator for park managers to determine trends in backcountry, recreational-use impacts. Compiling an inventory of media features on the park and analyzing it alongside backcountry patrol data creates a powerful tool for making decisions on wilderness management. The methods used in the construction of this map may have useful implications for any national park seeking to preserve wilderness character.

Literature Cited

- National Park Service. 2014. General Management Plan Amendment/Wilderness Stewardship Plan/ Environmental Assessment. November 2014. Gates of the Arctic National Park. National Park Service, Fairbanks, AK. 160-161 pp.
- Walton, J. and S. Stehn. 2014. Moving beyond the minimum: The addition of nonvascular plant inventories to vegetation research in Alaska's national parks. *Park Science* 31(1):62-69.

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NPS 185/138261, May 2017

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