

SOCIAL (media) CHANGE:
Enhancing national park tourism education and experiences
with updated app technology

by

Bridget E. Hake

A REPORT

submitted in partial fulfillment of the requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture and Regional & Community
Planning

College of Architecture, Planning and Design

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Approved by:
Major Professor
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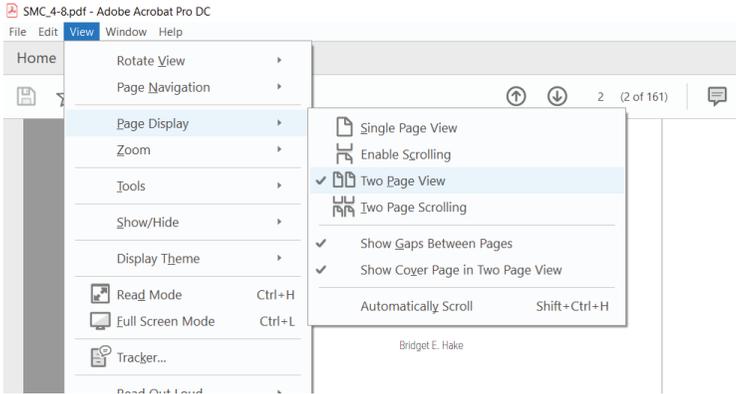
Abstract

Our national parks are at a crossroads right now balancing their two goals: risking deterioration by allowing all of “this and future generations” to use, or limiting access for all in order to “preserve unimpaired the natural and cultural resources and values of the National Park System” (National Park Service 2018). Shifts in communication, information, and travel have made national parks more accessible than ever which is causing some of our most treasured landscapes to become overcrowded and damaged (Pickering 2011). Media and campaigns have contributed heavily to park visitation since its conception, but new technology brings new ethical responsibility to advertising nature-based tourism. Social media and other apps have largely contributed to the misuse of our public lands with few positive applications (Tan and Lu 2019). This report explores the history of communications within the national parks, how new media is changing our interactions with parks, the negative impacts of continued mass tourism, and finally proposes a new public lands app that could potentially positively impact our parks and promote healthy tourism.



Enhancing National Park Tourism Education and Experiences with Updated App Technology

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A report submitted in partial fulfillment of the requirements for the degree:
Master of Landscape Architecture

Department of Landscape Architecture and Regional & Community Planning College of
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**LANDSCAPE ARCHITECTURE AND
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THE COLLEGE of
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SOCIAL (media) CHANGE

Enhancing National Park Tourism Education and
Experiences with Updated App Technology

Bridget Hake | Master of Landscape Architecture
Major Professor Howard Hahn | Spring 2020

abstract

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Chapter one

1



Intro_duction

Dilemmas and Questions



Intro_duction This section outlines the primary dilemma and research question along with secondary project considerations



Intro_duction

dilemma

The primary driver for this project is the concern for mass tourism in national parks. Mass tourism is linked to several types of negative impacts on our landscapes including damage to vegetation from trampling, changes in wildlife behavior and reproductive cycles, increased erosion, changes to hydrology, and habitat loss (Pickering 2010, 551). Our national parks are America's crowning jewels to be preserved and protected for generations to come. Continued misuse and mistreatment of our parks can lead to their rapid deterioration. Understanding the history of park visitation and asking why there has been a sudden major increase in tourism will be the first step to being better prepared to protect them. Studies have shown that media, specifically social media in recent years, have had an enormous impact on tourism in nature destinations (Narangajavana et al. 2015). These negative impacts coupled with the rapid increase in tourism call for a media revolution: using social media and marketing in a positive way to promote healthy and responsible tourism.

Research Question

How can social media and updated app technology be used to impact the parks or other conservation projects in positive ways?



Figure 1.0: Research Outline Diagram
(Hake, 2020)

Secondary Dilemmas

- What other significant events in history have had large impacts on park visitation? (war, depression, personal vehicles, etc.)
- How does history inform the future use of communication for the monitoring, funding, and ecologically conscious use of our national parks?
- Mass tourism may have a lot of negative impacts on park, but what are some positive effects?
- How would a “no tag rule” affect park visitation?
- How does policy and political legislation affect park use?

Chapter two

7



Background.02
Literature Review



Background.02 This section contains the literature and supporting information that will guide the project.



Background.02

a brief history of tourism and media in our national parks

Over the years, America's West has gone through a lot of changes. What was once a roving homeland for American Natives has hosted early European expeditions, bloody battles, a rush for riches and new opportunities, advances in transportation, and ever-growing cities among some of the most diverse landscapes America has to offer. Settling here was far from easy, but a series of idyllic mass communication methods through the years set the plan in motion, bringing people west in hopes of achieving the American dream. The following timeline is a summary of the major milestones for communications related to the National Park Service (NPS) and attracting settlers or tourists to the West.

1871 Early American Exploration with Paintings and Sketches

Some of the earliest images that captivated American easterners were the sketches and paintings produced by Thomas Moran, an artist invited on the Hayden Geological Survey of the West in 1871. His portraits and early descriptions of the glory of Yellowstone influenced a generation of conservationists and preservation movements (National Park Service 2018). Before Moran and his lifelike paintings of western landscapes, many people did not believe the stories they had heard about those untamed areas. Because so much of the West was unsettled at this time, people had little hope to actually be able to visit these magnificent places, but they were inspired to take pride in the land of their new home country (National Park Service 2018).



Figure 2.1
The Grand Canyon of the Yellowstone by
Thomas Moran , 1872

1900-1916 See America First!

The first “official” campaign for the national parks was in collaboration with the Great Northern Railway (Heacox 2016). This campaign was about forgetting European rail travel and instead experiencing the wonders of America by rail. The campaign was a significant contributor to park visitation, giving the parks economic and political relevance (Heacox 2016). Advertisements appeared most often as posters and small items such as luggage tags (Heacox 2016).

1930-1940 Works Progress Administration

Funded by the Federal Art Project within the Works Progress Administration (WPA), this campaign used silk-screen printed posters to not only promote the iconic features of some of our best parks, but also to promote safety in the parks (Heacox 2016). Posters like the ones for Yellowstone and Sequoia were meant to attract people to parks while posters like one featuring a car and deer were printed to call awareness to access and the need to protect park resources.

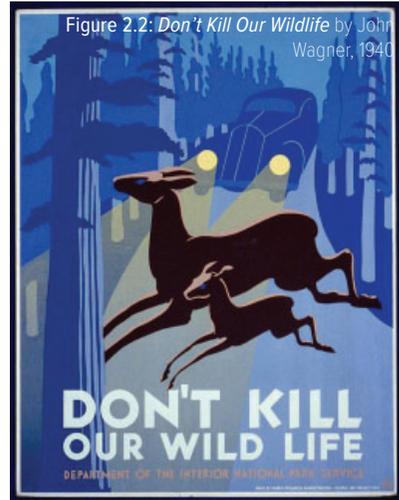


Figure 2.2: *Don't Kill Our Wildlife* by John Wagner, 1940

1941-1950 Ansel Adams's Photography Becomes a Voice for Park Creation

Ansel Adams, photographer and conservationist, has a long history with the national parks and the Sierra Club (Turnage 2016). He operated as a guide and the official photographer for the Sierra Club. He served on the board from 1932 to 1958 (Turnage 2016). David Brower, the club's first executive director stated, "It is hard to tell which has shaped the other more – Ansel Adams or the Sierra Club" (Turnage 2016). Travelling to beautiful places and photographing them was a passion

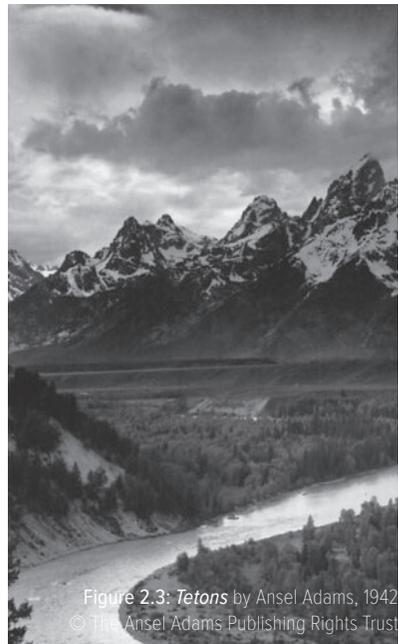


Figure 2.3: *Tetons* by Ansel Adams, 1942
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of Adams. In 1941, the Department of the Interior commissioned Adams with a photomural project to highlight the U.S. National Parks – only to be quickly interrupted by World War II (Turnage 2016). In lieu of this opportunity, he spent these years as a photographic consultant to the Armed Services and the Office of War Information (Turnage 2016). The year 1946 brought a new opportunity for Adams. He received a full fellowship from the Guggenheim to photograph the parks for two years. The fellowship was renewed in 1948 for an additional two years. This was a formative project for Adams as it resulted in the production of several books and portfolios to document America’s natural wonders through the camera (Turnage 2016). His books and photography have been used to aid the creation and conservation of numerous national parks across the country.

1956-1966 Mission 66

In the 1950s the parks were in danger of being loved to death as they were filled with cars, litter, and people. Without funding or staff to keep up with the deterioration, a bold initiative was proposed: a one billion-dollar nationwide park revitalization effort (Heacox 2016). At the time of its conception, Parks Director Conrad Hartzog knew park infrastructure was falling into disrepair. Dubbed “Mission 66”, the initiative would eventually replace many of the small structures built by the Civilian Conservation Corps (CCC) in the 1930s and replace them with over 100 modern visitor centers (Heacox 2016). “Visitor centers would not function as museums, but rather as facilities to introduce and orient large numbers of people to their parks and get them



Figure 2.4: *Mission 66 Signage* by National Park Service, 1956

among the mountains, flowers, and lakes where the real education and inspiration begins” (Heacox 2016, pg. 193). This optimistic initiative did not move forward without its fair share of push-back from environmentalists. Many worried that the new, modern visitor centers would be too cumbersome considering the sensitive landscape on which they would be built (Heacox 2016). Ansel Adams was even noted for saying that the symbol of Mission 66 should be a bulldozer (Heacox 2016). As we now know, the initiative for revitalization was not thwarted as planners insisted that all changes would be necessary for the long-term prosperity of the parks. During these ten long years of updating, the National Park Service acquired 78 new units for preservation including the Virgin Islands, Haleakala, Petrified Forest, and Canyonlands as well as the establishment of the service’s first two national lakeshores: Pictured Rocks and Indiana Dunes (Heacox 2016).

1978 National Parks and Recreation Act

In 1978 President Jimmy Carter signed the National Parks and Recreation Act. This act of preservation added an additional 1,974,005 acres of protected wilderness to federal control- one of the largest public land acquisitions for the National Park Service (Jackson 2015).

2014 Defense Bill

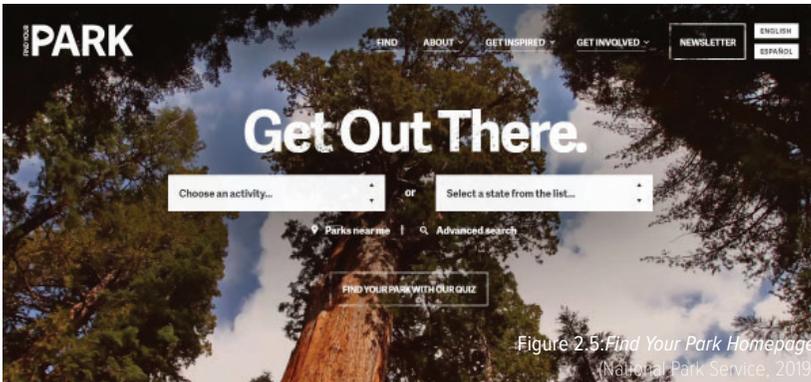
In 2014, the National Park Service welcomed its biggest addition of land since 1978. The Defense Bill, signed by President Barack Obama, was instrumental in creating seven new national parks in 2014 and 2015 and added 250,000 acres of protected wilderness areas (Jackson 2015).

2016 – National Park Service Centennial and Find Your Park Campaign

As the National Park Service celebrated their 100th anniversary in 2016, they also welcomed a new multi-media campaign called “Find Your Park”, which is still active today. The primary goal of this campaign is to reach out to millennials and city-dwellers, “who records show aren’t visiting National Parks nearly as much as the generations before them” (Jackson 2015). The idea behind this campaign is to provide seasoned park-goers with a newly minted platform that allows them to speak out and promote these places. The FindYourPark.com website enables visitors to upload and share their experiences in the parks in order to promote and inspire others to do the

same. This function aligns with information that is coming out about models for social media-based advertising in which companies are turning to social media, blogs, and other like-minded individuals for their recommendations on where to go and where to spend their money (Kádeková and Holienčinová 2018).

Another part of the Find Your Park promotion is the addition of a park locator that allows website visitors to input locations or interests and then the website makes suggestions based on that criteria (nps.gov 2019). The website offers additional special guides to trips such as “The Places Nobody Knows”, “25 Unforgettable National Park Hikes”, and “Gimme Shelter” which are unique places to stay overnight in and around the parks (Jackson 2015). The marketing for the campaign utilizes corporate sponsors like Budweiser, Subaru, L.L. Bean, Hanes, Nature Valley, and more to generate interest, donations, and host giveaways or other prizes for park-goers (nps.gov 2019). REI sponsored a new full line of products especially tailored to the national parks. The American Hiking Society launched a “Face of your Favorite Trail” photo submission in which hikers upload a headshot of themselves on their favorite trails for a chance to be featured in future promotions (Jackson 2015). Additionally, the Park Service collaborated with popular celebrities including Michelle Obama, Bill Nye, and Joseph Gordon-Levitt for online video promotions (Jackson 2015).



negative impacts of tourism

America loves its National Parks. Whether we want to admit it or not, parks are changing. Some of the changes are uncontrollable due to the earth's cycles and increasing effects of climate change. However, many changes that seem normal, like erosion, have been occurring much more rapidly in parks that have been altered and used frequently by tourists (Barber et al. 2016, 27). Populations of wildlife and vegetative species have decreased significantly, and some effects of tourism damage the recreational areas so much that the value of the landscape is decreased (Hill and Pickering 2007, 792). The National Parks are pieces of America to preserve for future generations. As America and the rest of the world continue to grow their urban environments and city centers, these parks are going to become increasingly important as escape and natural learning environments. This desire coupled with the potential impact of universal data, social media, and mass communication has led to more people visiting parks (Barber et al. 2016, 27).

Activity-based Impact

Simple activities in these primarily wild parks and preserves have been shown to have a strong impact on their wildlife and native environments. Three of the most popular activities in parks are hiking, biking, and horseback riding. These activities result in trampling and damage to the environment including widening of trails, changes in hydrology, compaction, changes in soil composition, exposure of roots, rocks and bedrock (Pickering

2010, 551). Trampling is the most common form of damage because most people that visit parks will participate in at least one of these three activities. A test done by Pickering 2011 tested the impact of mountain biking versus hiking across several transects. The transects were differentiated by the number of passes a hiker or biker could make ranging from zero to five hundred. Next, the transects were evaluated for their species composition and richness (Pickering 2011, 3049). In other parks, horses and mules play a significant role, not only in trampling, but the over-nutrition of soils and waterways from horse manure and the spread of weeds (Pickering 2010, 553).

Wildlife

There are several ways in which vegetation and wildlife are impacted by the presence of tourism. Mammals and birds in parks have been studied to find many adverse physical and psychological effects of human presence. Death or direct injury to wildlife is common in these areas due to the large number of travelers moving in and out of these parks every day along with the regular transportation systems running inside the parks. Other adverse effects include mood changes, psychological shifts, changes in parenting behavior, disrupted foraging, reduced reproductive rates, destruction of habitats, and the contraction of new diseases and parasites (Green and Higginbottom 2000, 188). Some of the most common changes are behavioral. These animals have been observed to have changed their foraging patterns and vigilance. In birds, studies have found changes in body temperature and increased heart rate. In many cases, birds show a decline in nest-building, eggs laid, and chicks hatched in areas of high visitation (Castley, Pickering, and Steven 2011, 2287). “Non-motorized nature-based tourism has negative impacts on diversity of birds from a range of habitats in different climatic zones and regions of the world” (Castley, Pickering, and Steven 2011, 2287). This is an important statement because these studies have occurred all over the world and have yielded similar results. In fact, it was noted that through a series of case studies, eighty-eight percent of researchers found adverse effects in their studied area’s bird population (Castley, Pickering, and Steven 2011, 2290).

A link between nature-based tourism and wild animals has caused concern about the domestication of wild animals and the disappearance of predators

from their natural environments (Geffroy et al. 2015, 755). “This can happen indirectly, where human presence decreases the number of natural predators and thus, they (the prey) become less wary, or directly, where human-habituated individuals become bolder and thus more vulnerable to predation” (Geffroy et al. 2015, 755). According to the article, some ecotourists believe in the method of small, kind contact with wildlife in order to ease them into a more comfortable routine with humans around, known as habituation (Geffroy et al. 2015, 755). The psychological effects that happen to animals in populated areas may have a much larger role in unnatural shifts in predator/prey behavior and other normal routines. An important result of these case studies was that it did not matter what type of impact occurred or how destructive it was; low impact activity such as walking or hiking near these habitats proved to have negative psychological effects on these animal populations. (Castley, Pickering, and Steven 2011, 2291).

Vegetation and Environment

Impacts within parks associated with vegetation include changes in soil composition, exposure of roots, changes in height or biomass, changes in species composition, and the introduction of weeds or non-native and sometime threatening species (Pickering et al. 2010, 551). “The exposure to soil on unsurfaced trails can lead to soil compaction, muddiness, erosion, and trail widening. The compaction of soils decreases soil pore space and water infiltration, which in turn increases muddiness, water runoff, and soil erosion” (Monz, et al. 2010, 555). Each of these characteristics can be attributed to hiking and camping habits of visitors (Monz, et al. 2010, 554). It is common for tourists and park-goers to begin to form their own informal, social, or illegal trails - contributing to the damage or disturbance of the vegetation (Pickering, Rossi, and Barros 2011, 3050). Mountainous regions have a much higher susceptibility to these disruptions in biological activities because degradation and erosion are only intensified with dramatic and growing shifts of terrain inclination (Dudek 2017, 1425). One study compared the effects of mountain biking along transects compared to hiking to see which (if any) contributed a higher amount to the disturbance. “Both resulted in vegetation loss, reduced species richness and increased soil exposure. The only significant difference in impacts or vegetation recovery between the two activities was more exposed soil after 500 passes by a mountain

bike compared to the same number of passes by a hiker, which could result in lasting damage” (Pickering, Rossi, and Barros 2011, 3050). It has been found through these tests, the most susceptible trait for disturbance was the height of vegetation (Pickering, Rossi, and Barros 2011, 3052).

A similar study conducted in the South American Andes found that much of the severity of these impacts is largely dependent on the texture of the soil, the amount of organic matter, the moisture content, topography, climate, and the amount or type of use - such as biking versus hiking (Barros, Gonnet, and Pickering 2013, 51). The differences between this study and the previous one with the transects is that this one looked at how the types of regions reacted differently to impacts. The researchers tested impact in meadows, steppe, and alpine vegetative zones with the following results: greater soil loss occurred on meadow trails, steppe regions were the most susceptible to exposed soil and rock, and trampling was a major factor in the decline of sedges, herbs, grasses, and shrubs on trails (Barros, Gonnet, and Pickering 2013, 56).

positive impacts of tourism

Despite the negative impacts that can occur in parks from tourism, there are several positive impacts that may also emerge. However, these positive impacts go much deeper than simply being our hubs for nature-based recreation and activity. Aesthetic appreciation is only part of what makes parks successful. Positive impacts are more about what our visitation can do to make these places better as a whole by providing economic support for surrounding communities, providing educational opportunities for visitors, and for the promotion of a better future for these areas.

Economic Opportunities

One of the biggest incentives for maintaining parks is the economic value that comes from the economic benefits they offer. Money made from national parks and preserves help support communities and the development of smaller towns by bringing tourists to their backyards (Green and Higginbottom 2000). Some small towns near national parks (primarily outside the United States) depend on national parks as their sole resource for economic support and their local businesses also depend on

tourism (Green and Higginbottom 2000). These towns and cities benefit greatly from the influx of foreign funds, the increase of employment and income, the improvements of pay balance, and the increase in investments put back into the area (Kostic, Lakicevic, and Milicevic 2018). These places also have an incentive to keep their parks well-maintained and provide better accommodations for visitors. Funding can help parks pay for several practical contributions that include the management of the parks, weed control, habitat restoration, monitoring activities, and continued research to assist with conservation efforts (Green and Higginbottom 2000). The money made from tourism in parks can also be used for park preservation and conservation. “There are several cases where wildlife tourism has apparently not only covered costs of ensuring sustainable management of wildlife habitats but has resulted in benefits for wildlife that would not have occurred without this tourism” (Green and Higginbottom 2000, 190). There is a certain standard with these parks for providing economic incentive for conservation. The use of these parks and preserves is reliant on conservation and the conservation of them is reliant on funding (Green and Higginbottom 2000).

Learning and Stewardship

A major positive outcome of parks and preserves is the implementation of programming for the continued education of their visitors. Benefits of teaching people about nature and gaining their appreciation play a huge role in the effort toward conservation (Green and Higginbottom 2000). Consistent activity and tourism provide substantiation for keeping parks open, keeping them funded, and ensuring that regulations are put in place to assist in the preservation of them (Kellett 2016). These areas are currently funded with 1/15 of one percent of our annual tax dollars (approximately \$2.56 per year, per person) and are in danger of further budget cuts (Kellett 2016). Without large amounts of yearly tourism, many of our parks would not exist. Tourism provides the incentive for policymakers to protect our most popular and highly trafficked tourist destinations. Policies that are in place in our parks include those in management and park-wide efforts that protect wildlife and vegetation from excessive damage and also the regulation of high capacity tourism activity (Rankin, Ballantyne, and Pickering 2015).

social media revolution

“The Mac in 1984 is an experience that those of us that were there will never forget. And I don’t think the world will forget it either. The iPod in 2001 changed everything about music, and we’re gonna do it again with the iPhone in 2007. We’re very excited about this” (Jobs, 2007).

This quote from Steve Jobs at the unveiling of the first iPhone at the Macworld Conference & Expo held in Moscone West in San Francisco, California on January 9, 2007 (Wright 2018). By this time, Apple knew the level of influence they held on the consumer population, but each year the sophistication of technology grows that influence exponentially. We now live in a time of unprecedented accessibility to knowledge and communication. The long-term effects of this accessibility are largely unknown, but we can see its impact every day. Popularity of the smartphone has revolutionized the way we search and post media (Narangajavana et al. 2015). Social networks such as Facebook, Twitter, and Instagram have become portals for sharing information, marketing, and fun. According to a study in 2014, four out of five internet users have at least one social media account, with Facebook

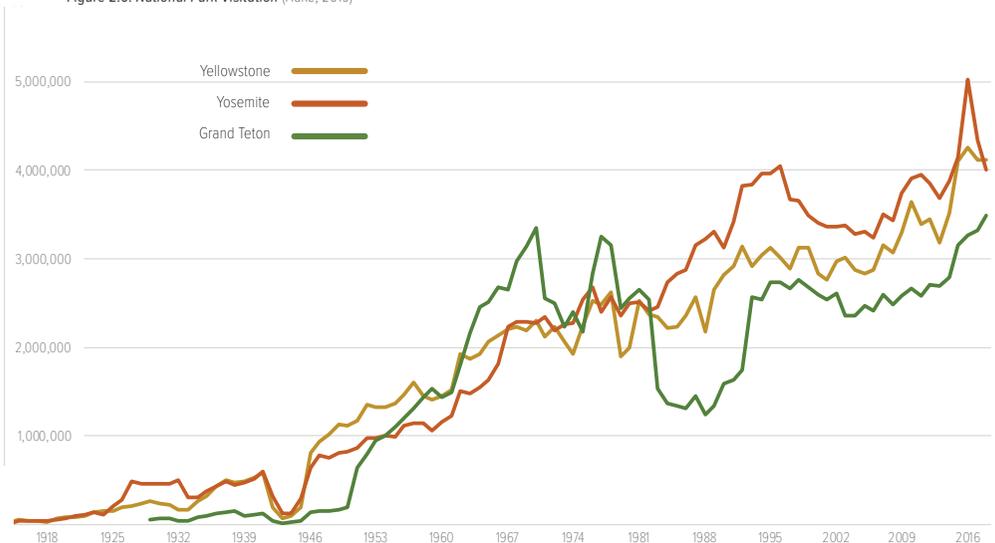
ranking as the most popular network around the world (GlobalWebIndex 2014). Then in 2017, Global Digital Statshot released data showing that 3.028 billion people, 40% of the world's population, have an active social media presence (Kádeková and Holienčinová 2018). The primary focus of this report was Instagram, which in 2017, reached over 600 million users worldwide (Mukhina et al. 2017).

Media is a connecting tool for communities. Real or virtual, people or organizations can spread word about common issues or goals through media to help raise awareness for these topics (Munar 2013). Social media thrives on user-created content with (usually) no overhead influence. Tourists can really benefit from these posts because, even though they may be a little biased, they are honest opinions. People do not leave their opinion to make money in the way that large companies try to influence visitors so tourists can have peace of mind when trusting another user with similar interests for advice (Zeng 2013).

Impacts of Modern Media on Tourism in National Parks

Around the time of the invention of the iPhone and since the creation of Instagram, parks have seen an unprecedented rise in attendance. This

Figure 2.6: National Park Visitation (Hake, 2019)



report identifies just how influential social media is on travelers. Instagram “influencers” are common culprits for this phenomenon. Social media utilizes and satisfies two major purposes: 1) socializing and setting up and maintaining relationships and 2) sharing and searching for interesting content (Narangajavana et al. 2015). On the side of sharing and searching for interesting content lies another set of two characters: 1) people who look for information or assistance and 2) those who are excited and willing to share their opinion or experiences with others (Nezakati et al. 2014). Electronic word of mouth, or eWOM, consists of sharing information or advice through a digital platform.

Younger generations turn to social media for tips, advice, inspiration, and much more. This growing reliance on media has created a trust between like-minded users (Zeng 2013). Instead of looking to private companies, agencies, or other marketing organizations, networkers are turning to each other for answers or recommendations because there is a sense of honesty in user-generated content that makes it more reliable (Zeng 2013). This means that social media could play a more significant role in influencing where tourists go than any other agency and could be responsible for positive or negative outcomes associated with the resulting behavior in parks. The primary audiences for influencer activity and social media marketing are young people born between 1981 and 2001, commonly referred to as Millennials (Kádeková and Holienčinová 2018). This demographic is known to “prefer visual content such as videos, photos or music and tend to ignore long written texts. They travel a lot, dress well and care for their health and healthy lifestyle” (Kádeková and Holienčinová 2018, 93). These lifestyle trends have laid the foundation for these influencer “icons”.

The Role of Social Media Influencers

The “peer to peer” engagement on social media is quickly becoming one of the most effective forms of advertising (Chang and Wang 2019). Word of mouth information spreading about brands or products by influencers is used by approximately 75% of marketers (Hughes, Swaminathan, and Brooks 2019). Influencers are defined as people with a large following who can persuade others through their personality, virtues, and authenticity

(Kádeková and Holienčinová 2018). They are paid by brands in the form of free products, trips, and cash for each promotional post (Kádeková and Holienčinová 2018). “Proper use of influencer marketing is a cost-effective way of promoting goods, people or ideas, bringing creative content to the company and offering the ability to reach target groups in a natural way” (Kádeková and Holienčinová 2018, 92). Influencers typically fit into one of three categories: industry experts, celebrities, and content-creators or micro-influencers (Kádeková and Holienčinová 2018). Content agencies are a medium for supporting influencer activities and the type of influence is related to the agency. These agencies are split into four different categories: bloggers, YouTubers or vloggers, celebrities, and Instagrammers. The primary agency of this report will be the Instagrammer. The unique characteristic of Instagrammers is the use of high-quality photographs to attract their audience. These influencers may be celebrities but are typically not (Kádeková and Holienčinová 2018).

positive media practices

Keep Jackson Hole Wild

Jackson Hole, Wyoming, a city at the gates of Yellowstone and Grand Tetons National Parks refers to themselves as one of the last true mountain towns. Such scenic beauty and value can deteriorate quickly if not cared for and thoughtfully used. For this reason, Jackson Hole has produced a series of sustainable principles for visitors to use as a guide to reduce their impact on these natural wonders. Principles include items such as using public transit where possible and giving wildlife space, but a new addition has addressed the way people post to social media here. “Keep Jackson Hole Wild” is their message for preventing the overuse of a natural space due to location tagging on social media such as Instagram. “Every time someone captures stunning scenery and tags the exact location, crowds follow” (Visit Jackson Hole 2019). The idea is that instead of tagging the exact name or location



**KEEP JACKSON
HOLE WILD.**

Figure 2.7: *Keep Jackson Hole Wild* (Visit Jackson Hole, 2019)

of a photo on social media, users are encouraged to tag a generic “Tag Responsibly. Keep Jackson Hole Wild” to reduce the accessibility to exact locations (Visit Jackson Hole 2019).

Leave No Trace

The Leave No Trace Center for Outdoor Ethics is an organization that believes education is our most reliable resource for protecting our outdoor spaces and keeping them from having to go through costly construction and regeneration processes. Originally practiced for backcountry camping, Leave No Trace has evolved their principles to fit any outdoor adventure or situation. Their seven primary principles are to plan ahead and prepare; travel and camp on durable surfaces; dispose of waste properly; leave findings; minimize campfire impacts; respect wildlife; and be considerate of other visitors (Leave No Trace, 2019). The organization’s primary platforms for disseminating information is a website which includes all the primary information about the company, their background, and mission. In addition, they operate an Instagram account which posts smaller bits of information about each of the principles or the organization’s general goals and how you can apply them to your trips.



Figure 2.8: *Leave No Trace Guides* (Leave No Trace Center, 2019)

boundaries

This project and report uses several national parks and national recreation areas as examples through text, maps, and bases for the prototype app in the methods and research section. The parks being used have been chosen for their contrast in popularity. On one side of the spectrum are the popular park examples of Yellowstone, Grand Teton, and Yosemite. In addition to being some of the most visited national parks, these three were chosen because they were established early after the

Figure 2.9: *Grand Tetons*
(Hake, 2019)



establishment of the National Park Service. Yosemite and Yellowstone were both established in the 19th century and Grand Teton came a bit later in 1929. The majority of the historical comparisons occurred after 1929. In contrast, other lesser visited parks and recreational areas were selected for the purpose of comparing visitation, relative activity or landform similarities, and location similarities. For instance, Death Valley, Pinnacles, and the Santa Monica Mountains have been selected to compare to Yosemite because they are all located in California and are significant for their mountain landscape and aesthetics. Bighorn Canyon and the Sawtooth Mountains and Wilderness were selected for their proximity and aesthetic similarities to Yellowstone and Grand Teton.

glossary

Influencer

People with a large following on a social network that use their personality and authenticity as a marketing mechanism for brands. They are often paid with free products, trips, and cash for their promotional posts (Kádeková and Holienčinová 2018).

Instagrammer

A person using Instagram as their agency for sharing high-quality photographic content to attract their audience (Kádeková and Holienčinová 2018).

Mass Tourism

Parks have a capacity to which they can operate safely, and without significant intrusion from tourism and use. Mass tourism is the breaching of that capacity in which wildlife or vegetation are impacted in such a way that they cannot recover before being impacted again (Paresashvili 2014).

Nature-based Tourism

Tourism and recreation that occurs outdoors. This includes, but is not limited to, activities and sports within our national and state parks such as hiking, biking, swimming, bird watching, kayaking, and photography (Pickering 2011).

Hashtag or “Tagging”

Usually preceded with a “#” or an “@”, tagging is a social media function that turns words into links for users to easily find groups of similar content.

Chapter three



Methods.03

Overview of Research Methods



Methods.03 A breakdown of the four-part methodology driving the research project.



historical analysis

Objective

The purpose of doing an historical analysis was to provide an overview of media and communication projects that the National Park Service (NPS) has conducted through the decades. Introducing each of the advertising campaigns provides readers with a clear idea of what the NPS has done in the past to try to increase tourism. The culmination of the campaigns and other significant U.S. historical events were plotted and compared against visitation graphs for each of the three study parks: Yosemite, Yellowstone, and Grand Teton, to reveal potential correlations.



Description

To complete this portion of the research, the biggest and most relevant events in NPS history related to media were analyzed and evaluated. The evaluation's purpose was to try and pinpoint what was successful about each of the campaigns and see where the biggest impacts could be found. campaign.



Figure 3.1: Historical Analysis Timeline (Hake, 2020)

interviews

Objective

The purpose of the interview phase of the project was to provide a broad, but inclusive enough idea of how the study parks run and view their social media accounts. Interviews allowed a realistic and up-close look at how the parks function to see if smaller park goals aligned with those goals being tested through the app prototype. It was important to gauge what park staff saw as the biggest problems facing the parks today and compare their answers with research of recent years. They also provided insights into where there may be gaps in park communication to visitors or other important stakeholders.

Description

Two members of the National Park Service – Jake Frank, Yellowstone’s Social Media Manager and Scott Gediman, Yosemite’s Chief of the Public Affairs Office— were interviewed for this report. These questions were about how they see social media being used for the parks, how influential it is, things that they are doing well, things that could be done better, and items that may not be represented at all, but would be beneficial. Each hold slightly different positions within the media teams at their respective parks. Interviews were recorded and all interviewees received a cover letter and a copy of the questions to be asked before the interview. Each person gave verbal consent and agreed to a more conversational and informal interview that allowed more unseen information to be pulled out and used. Conversation was informal and had many open-ended questions to allow further discussion on the topics. These interviews were used to guide and add content to the final product of the prototype app. Interviews were conducted following research protocols of the Kansas State University Institutional Review Board (IRB) to ensure the rights and welfare of human research subjects (interviewees) were respected. A copy of the approved IRB application form along with the specific interview questions are provided in Appendix C.

media analysis

Objective

The objective for the smartphone app analysis was to select some of the top free apps related to national parks to compare app features. These apps were evaluated to create a baseline for development of a prototype app (Chapter 5).

Description

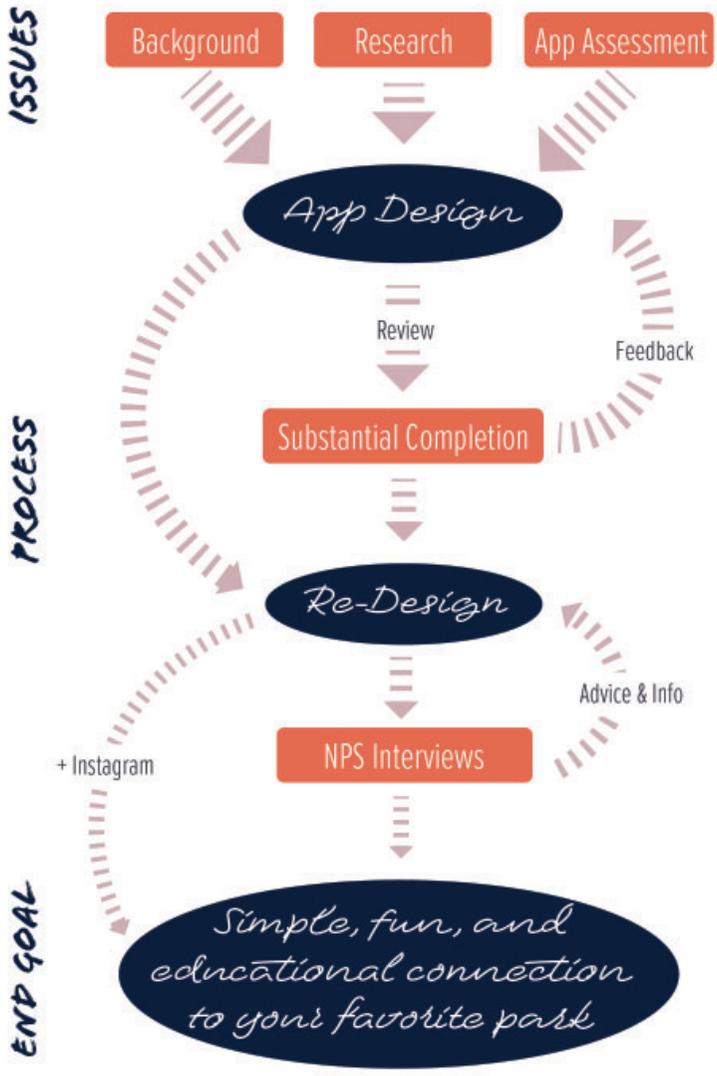
Precedent apps were chosen based on their primary concept as well as the high reviews by users. A running list of each of their features was kept so when other apps had a same or similar feature, they could be cross-referenced, and a box was checked for a simple visual comparison later. The goal of this searching was to see how many features the apps had, and more importantly, to see where they are lacking.

The apps evaluated in the Findings portion include: Chimani; REI's Guide to National Parks; Yellowstone by NPS; Grand Teton by NPS; Yosemite by NPS; All Trails; Topographic Maps and Trails; Hiking Project; NPS Parks; and Oh, Ranger! The categories for the app features were split into five different categories.

- 1.General
- 2.Communication
- 3.Location
- 4.Interactive
- 5.Learning

Specific functions that fell under these categories and their descriptions can be found in the Findings portion of the report. Results were summarized through a comparison table of specific app functions, followed by an overall metric comparison. The metrics consisted of a simple percentage of how many functions each app supported. Specific descriptions of the functions analyzed were also set in the context of the author's user experience and objectives. She provided her own personal opinion about each app, described the experience of using it, assessed app "smartness", commented on the app's design aesthetic, and finally gave the app a personal rating. Finally, once all ten apps were scoured and reviewed, metrics were created to compare their capabilities. It was not an issue if the apps had limited functions, but the review was a driving force for the creation of an original app by the author, as it is meant to be a simple, all-inclusive tool for connecting to and learning about the parks.

Figure 3.2: Methods Diagram (Hake, 2020)



hashtag analysis

Objective

During this analysis, several park hashtags were searched within Instagram in order to help visualize how crowded or popular certain portions of the parks are. To do this, three example parks (Yosemite, Yellowstone, and Grand Teton) were used as the subjects. For each park, several locations, hikes, and scenic areas were noted and searched on Instagram in the form of a hashtag to see how many results each search would yield. Each search result was documented into a spreadsheet. This process was repeated for each of the park's locations. These three major parks were analyzed along with three smaller, lesser-used, parks. Chosen for their similar characteristics to the major parks, Sawtooth National Recreation Area, Death Valley National Park, and Pinnacles National Park were used to compare results.

Description

To conduct this portion of the research, three major national parks were used, along with three additional, lesser-known, parks to compare data. This analysis occurred in a series of steps:

1. Identify parks

Yosemite, Yellowstone, and Grand Teton were used, but the parks for comparison were chosen based on characteristics they shared with the three major parks. These parks are found in similar regions or the same state as the major parks, with similar topographic features, and similar scales.

2. Choose hashtags

To choose the hashtags to search on Instagram, I researched the parks individually, identifying key hikes, scenic spots, and visitor centers. Locations that readily popped up on maps or that were generally associated with the parks were used. Each location search came up with multiple related searches as well as a number stating how many posts were available with that tag. The most relevant tags were used, and total posts were added together. For example, a search for “#jennylake” also produced similar tags such as, “#jennylakegrandtetons”, “#jennylakestaff” and “#jennylakewyoming”. In this case, “#jennylakegrandtetons” and “#jennylakewyoming” would be used while “#jennylakestaff” would not because it was not as closely related to the place as the others.

3. Add hashtag totals and assign them a color on the heat scale.

4. Transfer color data to the maps of the parks.

Chapter four

47



Findings.04
Method Results



Findings.04 This section will outline the results of the Methods.



Findings.04

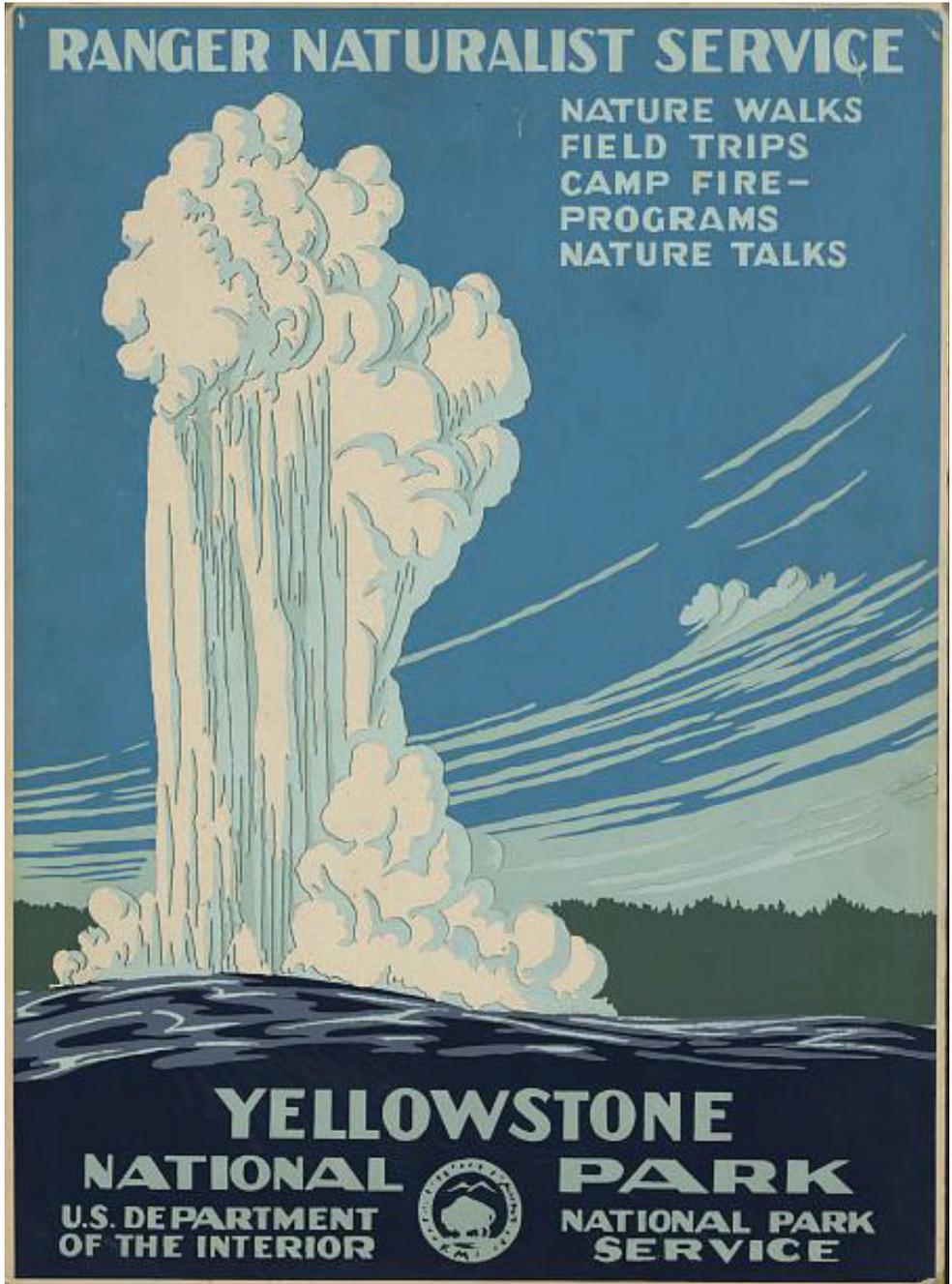
historical analysis

After reviewing the National Park visitation timeline compared against historical events and park media campaign dates, the following sub-sections discuss the rationale of why some of these events and media campaigns may have been responsible for visitation spikes or major upward trends. The clear trend is that steadily increasing visitation around 1930 (with the exception of World War II) and 2007 which is thought to coincide with the output of the Works Progress Administration and the invention of the iPhone and Instagram respectively.

Works Progress Administration

The historical analysis and timeline revealed how national park advertising, projections of landscape appeal, and visitation fluctuations changed over time. This portion of the research informed much of the reasoning behind the need for a change in media responsibility. It is known that media significantly influences tourism but seeing how

Figure 4.1: Yellowstone WPA Poster
(Powell, 1938)



“But a small fraction—14 of some 35,000 designs—became some of the most iconic posters ever created: The National Parks posters. Glacier. Yosemite. Mount Rainer. Grand Teton” (Bennett, 2016)

much it will help when evaluating possibilities for new programs and options for being a healthier and more ethically responsible tourist. This portion will also include an analysis of the effectiveness of the types of media and projects being studied.

In reviewing the earlier portion of the timeline, there are a few events or milestones that stand out as being the most significant and beloved to this day. The first of these works is the series of Works Progress Administration silk screen prints from 1935. As part of the New Deal, billions of dollars were allocated to hiring the unemployed for public works projects (Bennett 2016). Most notably, these workers were part of construction crews that built roads, bridges, and more infrastructure across the country. Lesser known is that the WPA also hired creative types for several other projects including writers, painters, musicians, actors, and directors. They worked to create paintings, murals, sculptures, photographs, set designs, museum displays, crafts, and of course, the millions of- now famous- silkscreen posters (Bennett 2016). These posters promoted more than national parks. They were created to promote education, public health, travel, and war propaganda. “But a small fraction—14 of some 35,000 designs—became some of the most iconic posters ever created: The National Parks posters. Glacier. Yosemite. Mount Rainer. Grand Teton” (Bennett 2016). It is estimated that 1,400 posters for the national parks were printed, but only 41 posters have survived with Wind Cave and Great Smoky Mountain being documented

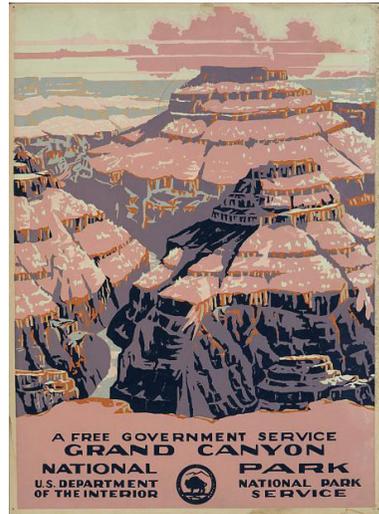


Figure 4.2: Grand Canyon WPA Poster
(Powell, 1938)

only through black and white photos of the originals (Bennett, 2016).

For 50 years these posters seemed lost but they were revived in the 70s by “Ranger Doug”, a former park ranger and art enthusiast. He dedicated his life to tracking down the missing posters and restoring or remaking those he found to their former glory (Bennett 2016). Many posters have been lost, badly damaged, or are hid away in private collections. Once Doug collected and used the posters for reproduction work, he donated them to the Library of Congress (Bennett 2016). About half of the original designs now reside in the Library of Congress in the public domain.

It is unclear what the exact impact the WPA posters and works had on tourism rates, but like any renovation project, interest was sparked. At its highest point, WPA employed 5,300 individuals across the country, and set up an Art Teaching Division that gave classes to over 50,000 children and adults (Decker, 2019). The other projects going on with the WPA would reach across the country also drawing attention to new hospitals, airfields, storm drains, bridges, roads, and tree plantings (Decker 2019). For today’s media, these WPA posters caused a ripple effect for marketing as the parks used the recreations and spin-off art to promote nostalgia and history within the parks for the centennial in 2016.

Ansel Adams’ Photography

“Won’t it be wonderful when a million people can see what we are seeing today?”(Muir, 1910). This quote from John Muir speaking to William Colby extolled the grandeur they were viewing from Glacier Point. To them, one million people seemed far-fetched, but became a reality following World War II and the spread of the photography from Ansel Adams.

Ansel Adams’s photography and work with The Sierra Club was unprecedented in the success of conservation efforts. He had the ability to speak and persuade others with his art to conserve our natural wonders such as the Sierras and Yosemite Valley. The creation of Kings Canyon National Park was the work of several groups, but it was his photographs which “have an excitement in them which commands more attention than if they were the same scene not composed or adequately printed...I think the pictures I had of the Kings Canyon-Sequoia region did have a helpful effect

in getting Congress to pass the bill” (Adams 1940). For years following the christening of Kings Canyon, Adams was commissioned to work on several art projects for the Department of the Interior to call attention to these magnificent places through the lens of his camera. His work was distributed across the country in the form of books and prints.

The masses of people coming to Yosemite in part from the work of Adams put a lot of pressure on the National Parks Service’s principles “that the national parks must be maintained in absolutely unimpaired form for the use of future generations” (NPS.org 2019). This concern over the high numbers of visitors and the resort-like activities they brought with them became enough cause to have conversations about regulating activity and promoting a return to “contemplative appreciation of nature” that was practiced by John Muir and other early nature conservationists alike (Turnage 2016).

Mission 66

In the 1950’s, the National Park Service responded to calls for a return to quiet contemplation with a “more the merrier” attitude to the newfound popularity of the parks (Turnage 2016). The park service initiated a project to prepare for an anticipated 80 million visitors across the nation by 1966 (Mission 66 1997). Mission 66 became the beginning of a new era for national parks, kickstarting several new projects for renovating, creating infrastructure, and sparking new interest in visiting parks. Some of these projects generated a lot of friction between the National Park Service and conservation groups because of the fragility and sensitivity of the areas in which these big new projects would take place. However, when it was all

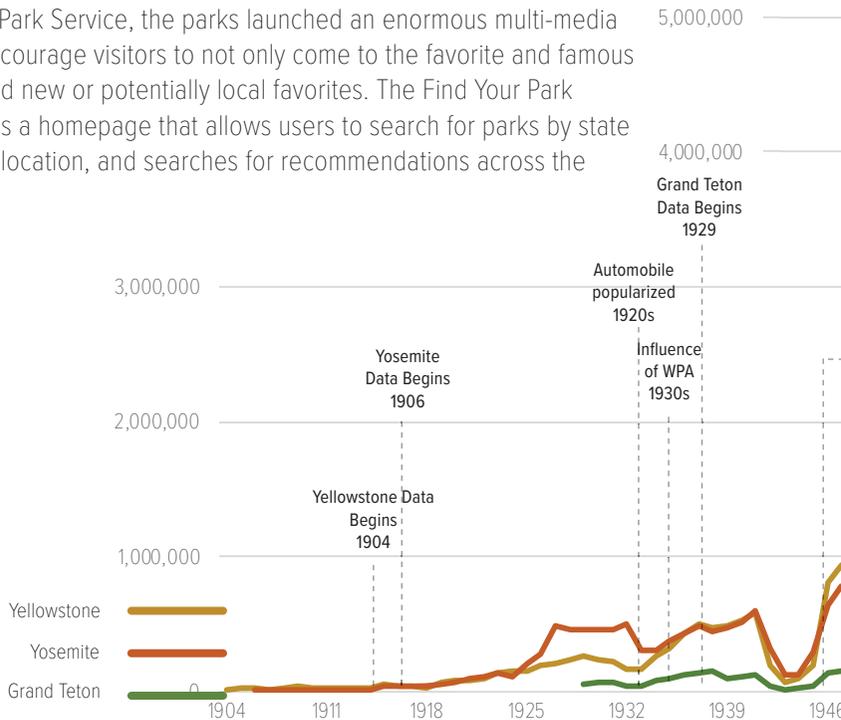


Figure 4.3: Ansel Adams
(Greany, 1950)

over, the parks had hundreds of new facilities and visitor centers to be proud of and the parks visitation numbers for the 50th anniversary were higher than ever. During Mission 66, the National Park service was potentially the largest single proprietor of landscape architects in the world and by 1961 the project hired more than four hundred permanent landscape architects, architects, and engineers to their staff (Mission 66 1997).

Find Your Park

Modernization of media and the instant spread of advertisements on the web has resulted in an unprecedented rise in tourism in our national parks. It is unclear if the media is solely responsible for this rise, but the numbers and rises in attendance surrounding the rise of the internet, invention of the iPhone, and popularization of social media such as Instagram and Facebook certainly seem to point in that direction. In 2016, to celebrate the centennial of the National Park Service, the parks launched an enormous multi-media campaign to encourage visitors to not only come to the favorite and famous parks, but to find new or potentially local favorites. The Find Your Park website features a homepage that allows users to search for parks by state or their current location, and searches for recommendations across the



many categories of national park property including sites such as historical monuments, battlefields, lakeshores, and more. Park rangers even credit a rise in tourism to this media effort and are considering even more new ways to interact with new media in national parks such as interactive signage, which is a way for visitors to use signs and view realistic wildlife imagery in a real-time scene on their phone screens.

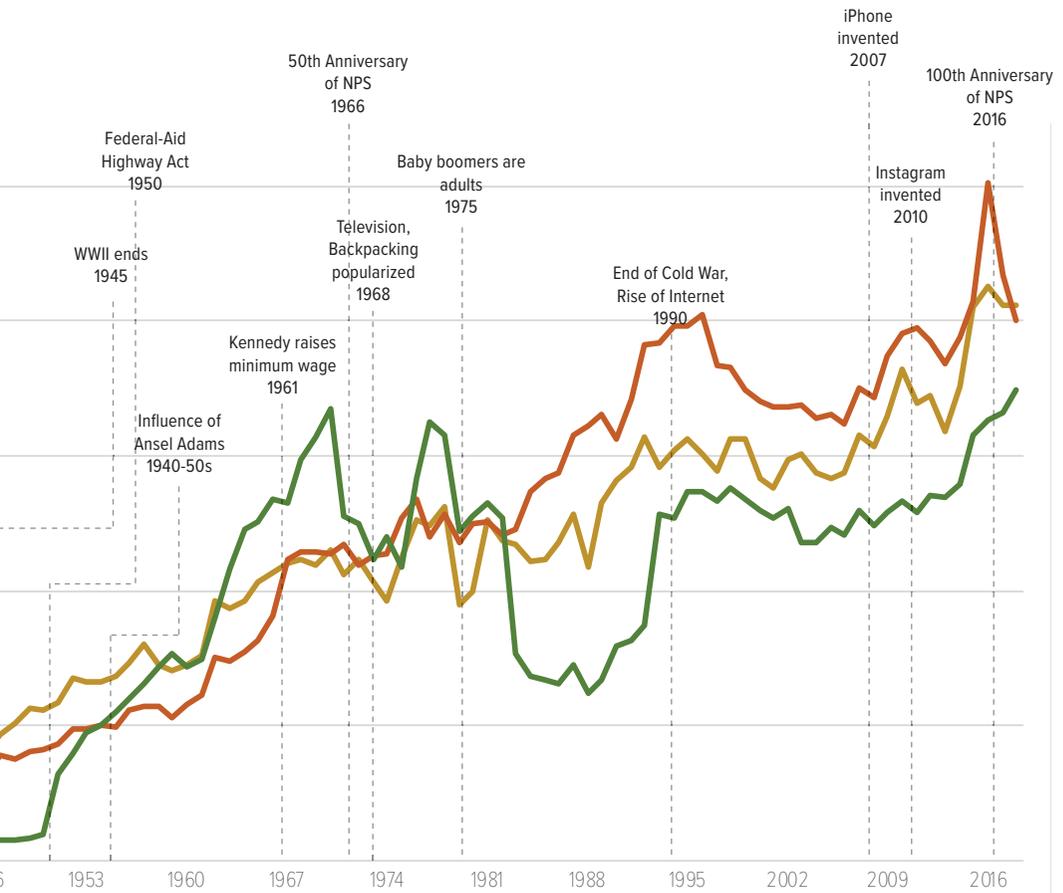


Figure 4.4: National Park Visitation
(Hake, 2019)

interviews

Two NPS professionals – Jake Frank, Yellowstone’s Social Media Manager and Scott Gediman, Yosemite’s Chief of the Public Affairs Office—were interviewed via phone calls. Questions asked were specific to the parks in which they work. These questions were about how they see social media being used for the parks, how influential it is, things that they are doing well, things that could be done better, and items that may not be represented at all, but would be beneficial. Conversation was informal and had many open-ended questions to allow further discussion on the topics. These interviews were used to guide and add content to the final product of the prototype app.

Interview Findings Summary

It was clear from the interviews that each park operates under their own initiative. The National Park Service does not have a strict overhead of guiding principles for the parks' media to follow. Mr. Gediman explained that the media and social media are separate affairs. Though they communicate and work together at times, his day-to-day work is focused on the media side with news and press releases.

Both interviewees seemed to have a similar mission with their team as far as what they want their teams to focus on for the public. Education and safety are their biggest priorities for communicating to the public. Both were able to acknowledge that there has been a significant increase in tourism traffic and, though they cannot relate it back to a singular cause, media may have a role in the increased activity. It has been a challenge for their teams to shift gears in recent years to keep up with the constant changes happening with technology

Mr. Frank's role in the Yellowstone's social media is extremely hands-on. Though he deals primarily in web and social media, he also spends a significant amount of time with visitors and teaching them about his job. Teaching and diversifying the parks was a common theme for both interviewees. They have both noticed that a lot of the information going out only reaches so far, and the challenge now is figuring out how to reach an even broader audience.

Both interviews generated knowledge for the project that would have otherwise been impossible to find from other methods. IRB approval for the interviews as well as the full set of questions may be found in Appendix C.

Interview Key Points

Scott Gediman, Chief of Public Affairs in Yosemite National Park

- Scott has been with the National Parks Service for 30 years. He spent several years working as a journalism and public affairs officer for Glen Canyon before coming to Yosemite.
- His staff currently includes 1 person - it used to be 5. Media at Yosemite has 5 different sub-categories: 1) media, news, and radio 2) tourism and destination marketing 3) legislative affairs (includes handling presidential visits) 4) international affairs and 5) public outreach.
- Job responsibilities include working in an office, guest interpretation at the Visitor Center, and working with film crews *“think Ken Burns”*.
- Some of the biggest challenges he stated about increased tourism is the traffic, lack of parking, and low resources. It has also been a challenge to adapt with social media. *“It’s all about the influencers,”* he says. Many of them visit the parks with good intentions, but some cause issues and even expect to be accommodated during their visit.
- Yosemite is such a big and popular park that public affairs are handled internally rather than at a national or regional level.
- When asked about how effective their media is at reaching a broad spectrum of demographics, Gediman stated, *“We are doing the best we can.”* They are working hard to make sure the information can reach far and wide.

Interview Key Points

Jake Frank, Social Media Manager at Yellowstone National Park

- Jake has been in his current position for 5 years, the past 3 have been spent with Yellowstone in new media. However, he has been a part of the NPS since 2008 when he started as an intern.

“I view part of my job as educating what my office does... to create content and put out new, up to date, and contemporary information for people as issues are constantly changing”

- The difference in help from peak season to off season is about 2:1 respectively. In Yellowstone that is 800 in the summer months compared to 400 in the off season.

- He described the media sharing strategy for Yellowstone in terms of chocolate and broccoli. The broccoli posts are full of information that, though it may be dull, is extremely important for visitors to know. The chocolate posts are beautiful images that keep followers interested and engaged. The theory is that there should be a balance between the two. Chocolate build your audience and when the broccoli needs to be shared, people are interested. Broccoli all the time might drive away the audience. The ultimate goal is to combine the two with “#choccoli”

- A lot of his interactions with the public are through the comments section on their social media posts, *“our best practice is to really to get in and answer as many questions as possible... especially with topics that are controversial.”*

- Jake made a comment about how social media is ephemeral if you only post once. *“If it’s something you want people to think about you should post about it all the time.”* He added that this is the best way to promote change with your audience.

media analysis

The expected outcome of conducting this analysis was to better understand what technologies and app designs currently exist to aid national park visitation. Analysis results helped identify which app functions might be candidates for inclusion in a new app prototype proposed by the author. The analysis also revealed gaps in existing app designs where the author could creatively add original ideas to the intended prototype. Finally, the prototype app design was compared to the ten existing apps using the same criteria to show where changes and improvements were made to the prototype app design and functionality.

Modern Media

The results of the Media Analysis were instrumental in the initial planning and structure of the proposed app design. In this section, ten different park apps were explored, each highly rated in the app store and each with a similar purpose or similar functions. Taking a closer look into

some of the features and characteristics were very telling in how these apps could be improved. The hypothesis about what appeared to be missing or what should be highlighted more was correct. It was assumed that people were missing out on a more direct connection to the parks service. There is limited opportunity for them to be heard and voice an opinion about the parks service. The volunteer process to get involved is lengthy and connections to show our support to the parks are inaccessible or non-existent.

To conduct this part of the research each app was observed individually. A running list of each of their features was kept so when other apps had a same or similar feature, they could be cross-referenced, and a box was checked for a simple visual comparison later. The goal of this searching was to see how many features the apps had and, more importantly, to see where they are lacking. After reviewing the features of an app, a quick review was written for the benefit of the author to remember the apps, about how aesthetic the apps were and how easy or intuitive they were to use. Finally, after all ten apps were scoured and reviewed, metrics were created to compare their capabilities.

Fifty-five categories came up in listing their features, and this also included the hypothesized categories. Reviewing the fifty-five categories provided a surprising revelation: no app carried more than 46% of the total features. This was an opportunity for continuing production of a new app and proved the initial research hypothesis as well: There is a need for a simple, comprehensive, and positive social media/learning tool for the national parks. Additionally, none of the five categories proposed to be included in the new prototype were covered in any of the ten tested apps. These additions included: Volunteer Link, Donations, Collaborative Trips, Achievement Perks, and 2-Way Communication. The functions that were shared by the most apps included: featuring multiple parks, mapping capabilities, downloads for offline use, location tracking, activity and location recommendations, sharing capabilities, photo storage, and trip planning. Moving forward, these functions were important to include in a new version as they are most common things that users are familiar with and would be missed if they were not included.

The apps created by the National Park Service unsurprisingly featured the most opportunities for learning and for the intricacies of visiting the parks. Features they had and no other apps included were photo collage, tour information, accessibility, services, and schedules. This information may also be important to include as a development goal for the prototype app so users feel a close affinity to the parks. One way to ensure this happens is to give users a link that will take them to the NPS website to learn more about the parks or to book their tours with the park service. The NPS apps were among the highest rated from the author's reviews in favor of their usability, simplicity, and aesthetic. They are great at communicating information about the parks, but they somewhat lack in personal touches or user-generated content (UGC). The only apps to include UGC were All Trails and NPS Parks, both of which rated relatively low in the personal review due to their lack of information and usability.

REI's Guide to National Parks app was the only app given a 10/10 rating for usability and aesthetic. Even though it had slightly fewer features than the NPS apps, it was a very modern look for the parks - something that should also be considered in the development



Figure 4.5: *REI Logo*
(SA, 2017)

of the new app. It surprising to see it was the only app that featured an emergency response section. If at any point in a hike or exploration a user is injured, lost, or in need of emergency attention, the REI app allows users to share their exact coordinates with others, call the local park emergency station, or call 911. This is a great move for safety in the parks, especially because it gives users options for contact for less threatening situations, as well as the 911 call.

Among some of the lowest rated park apps were Topographic Maps & Trails, NPS Parks, and Oh, Ranger! as they did not have the same traditional setup as the other apps. It is obvious that these would not necessarily be used for the same purpose as the other apps. They were somewhat lacking in capability and were the least aesthetic of the group. They were good

CHIMANI

GUIDE TO
NATIONAL PARKS

YELLOWSTONE

GRAND TETON

YOSEMITE

GENERAL

CATEGORIES REPRESENTED: 16



COMMUNICATION

CATEGORIES REPRESENTED: 10



LEARNING

CATEGORIES REPRESENTED: 7



ALL TRAILS TOPOGRAPHIC MAPS & TRAILS HIKING PROJECT NPS PARKS OH, RANGER!

GENERAL

CATEGORIES REPRESENTED: 16



COMMUNICATION

CATEGORIES REPRESENTED: 10



LEARNING

CATEGORIES REPRESENTED: 7



CHIMANI

GUIDE TO
NATIONAL PARKS

YELLOWSTONE

GRAND TETON

YOSEMITE

LOCATION

CATEGORIES REPRESENTED: 6



INTERACTION

CATEGORIES REPRESENTED: 9



General

- Multiple Parks
- Mapping
- Downloads
- Personalization
- Photos
- Weather
- Live Activity
- Link to NPS
- Offline
- More than NPS
- Photo Collage
- Tours
- Accessibility
- Services
- Schedules
- In App Purchases

Communication

- User Generated Content
- 2 Way Communication
- Ratings
- Sharing
- Tips
- Emergency Service
- Notifications
- FB Connect
- Garmin
- Apple Health

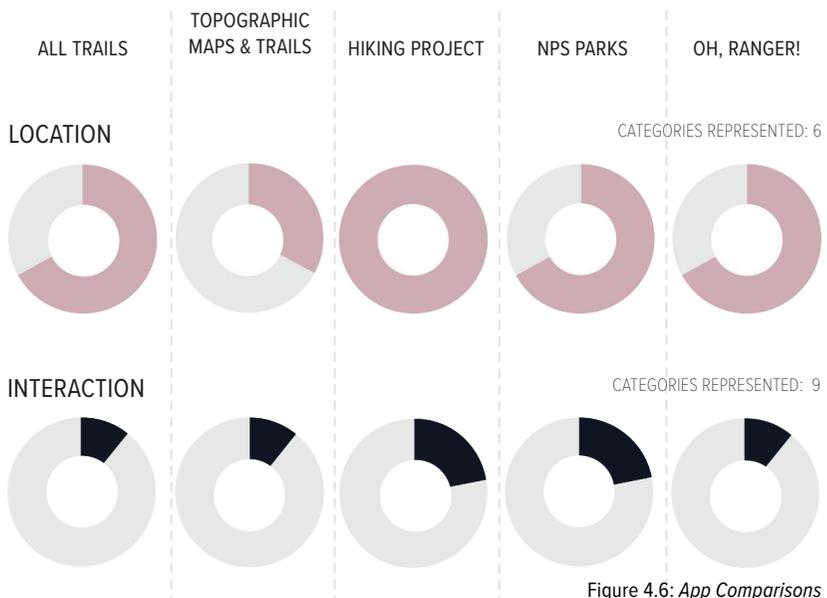


Figure 4.6: *App Comparisons*
(Hake, 2020)



Figure 4.7: *App Comparison Categories*
(Hake, 2020)

to include as a comparison though because their limitations give some perspective to how much the “good apps” have. Again, these apps may have different priorities for creation, so the assessment is only for the author’s personal app development and is not to say that these app do not have their unique strengths.

Individual personal reviews can be found below:

Usability Ratings:

Opinion ranking on a 10-point scale based on how easy the app was to navigate and how aesthetic the features were:

Chimani 8/10

Extremely easy to navigate and find useful features. Features well-organized sections for ALL different types of NPS sites. It also included some achievements based on how many parks users visit. However, it is lacking in information and variety.

Guide to National Parks by REI Co-op 10/10

Extremely easy to navigate and find useful features. Each page is aesthetic and well-organized. It is well connected with other associations in the NPS and features connections to its other sister apps.

Yellowstone by NPS 9/10

Very easy to navigate and features more information such as live webcams and wildlife information, however not as aesthetic as Teton or Yosemite NPS apps.

Grand Teton by NPS 9/10

Very easy to navigate. Although it has fewer features than Yellowstone’s app, it features a nice introductory sequence and has a more aesthetic look.

Yosemite by NPS 9/10

Very easy to navigate. Although it has fewer features than Yellowstone’s app, it features a nice introductory sequence and has a more aesthetic look.

All Trails 6/10

Easy to navigate, find parks, and use overall. However, even though it features detailed maps of several parks in and out of the parks, it has little information or tips for visiting the parks, safety info, or special features.

Topographic Maps & Trails by USGS 4/10

This app is okay to use. It has nice mapping features, but not much else for park information. Mapping gets a little crowded and muddy at times.

Hiking Project by REI Co-op 7/10

This is another nice app from REI. It is easy to use and provides nice maps. It does contain less information about the specifics of the park though as it is designed similar to All Trails- to map and store activity information.

NPS Parks by TripBucket 6/10

This app has a lot of information about the parks! With that information comes a price- there was too much happening with the contents and organization of the app. Informational, but overwhelming to use. At times very slow to load data as well.

Oh, Ranger! 3/10

This app is similar to Hiking Project and All Trails in function, but it is not as smart as those apps and is not near as aesthetic or well-organized.

hashtag analysis

Details of the heat mapping process were described in the Methods chapter. Reviewing the resulting heat maps show there is a significant difference between the main attractions and the rest of the park. It is normal for the parks to have a single “road of attractions” that tends to concentrate most tourists in confined areas of convenience. This is positive because having a single road or a loop restricts access of tourists to some degree, reducing their impact. This could also be a negative because it means that portions of the park are overused, more susceptible to damage, and tourists may be uneducated about what else the park has to offer. For instance, in Yellowstone, the most popular sites fall just off the edge of the road. These sites include Mammoth Hot Springs, Prismatic Springs, and Old Faithful. Visitors only need to park their car next to the scenic attraction,

take a short walk, and snap their picture. Portions of the park farther off the road are much less photographed which could mean that they are visited significantly less. There is a clear difference between these popular national parks and the minor parks. Tags in the minor parks never reach above 80K posts.

Number of Tagged Photos



Refer to this scale for the number of tags in the parks.

Park heat maps and comparison parks can be found on the following pages

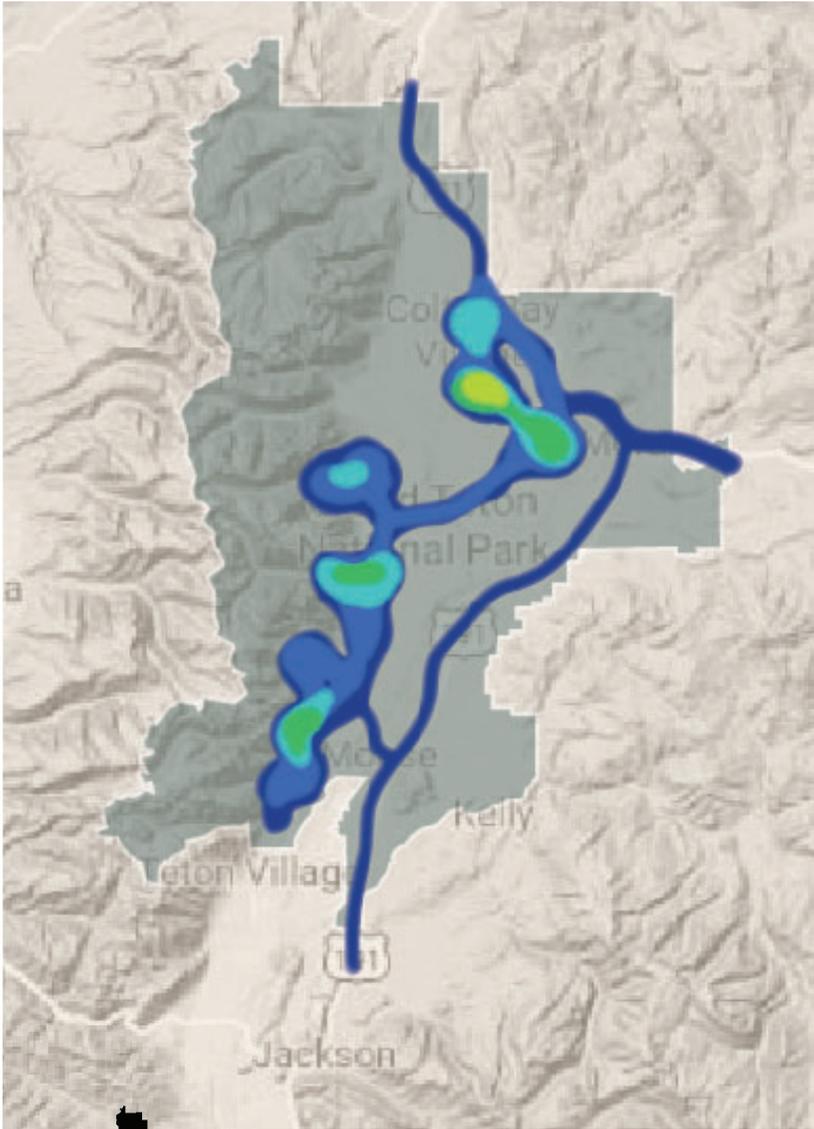


Figure 4.8: *Grand Teton Hashtag Heat Map*
(Hake, 2019)

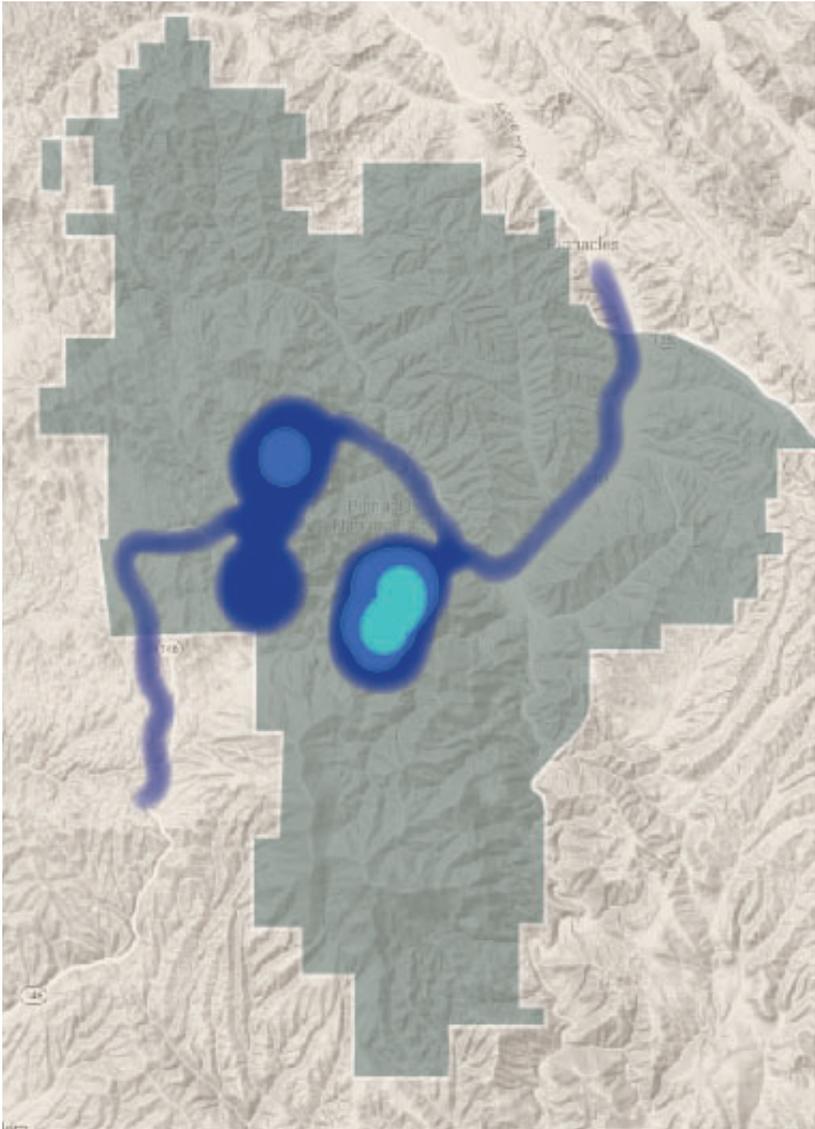


Figure 4.9: *Pinnacles Hashtag Heat Map*(Hake, 2019)

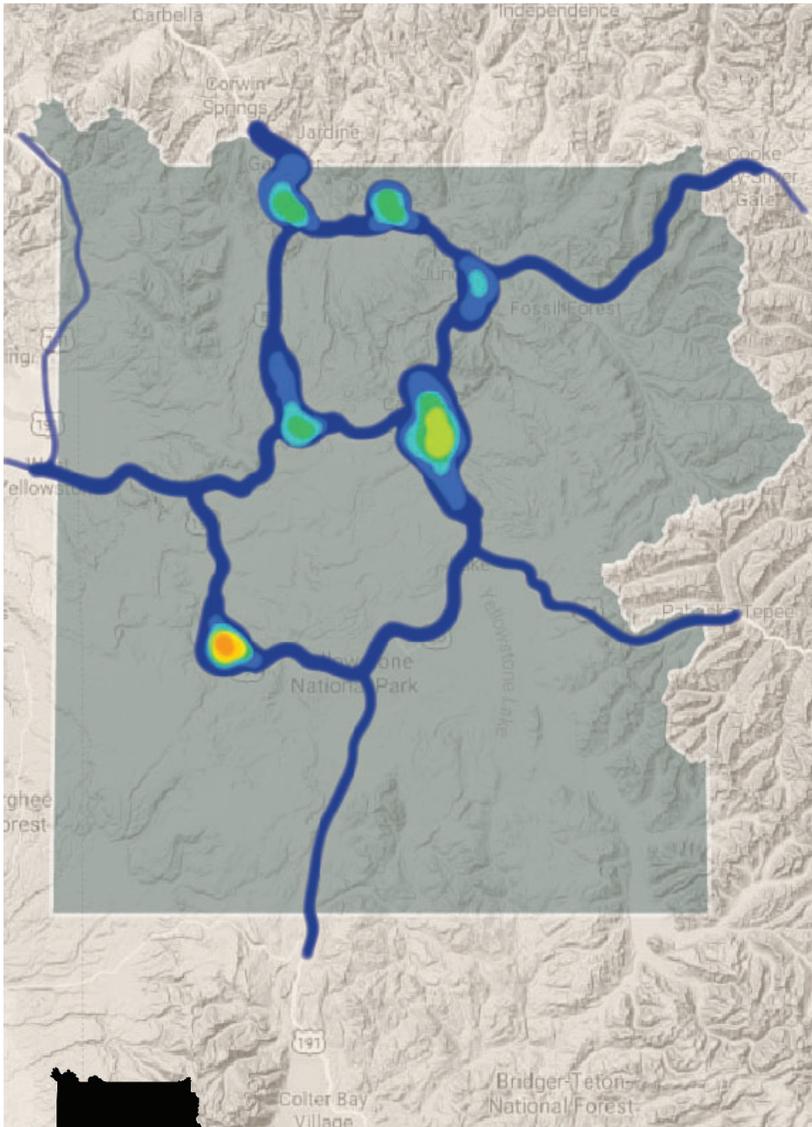


Figure 4.10: *Yellowstone Hashtag Heat Map*
(Hake, 2019)

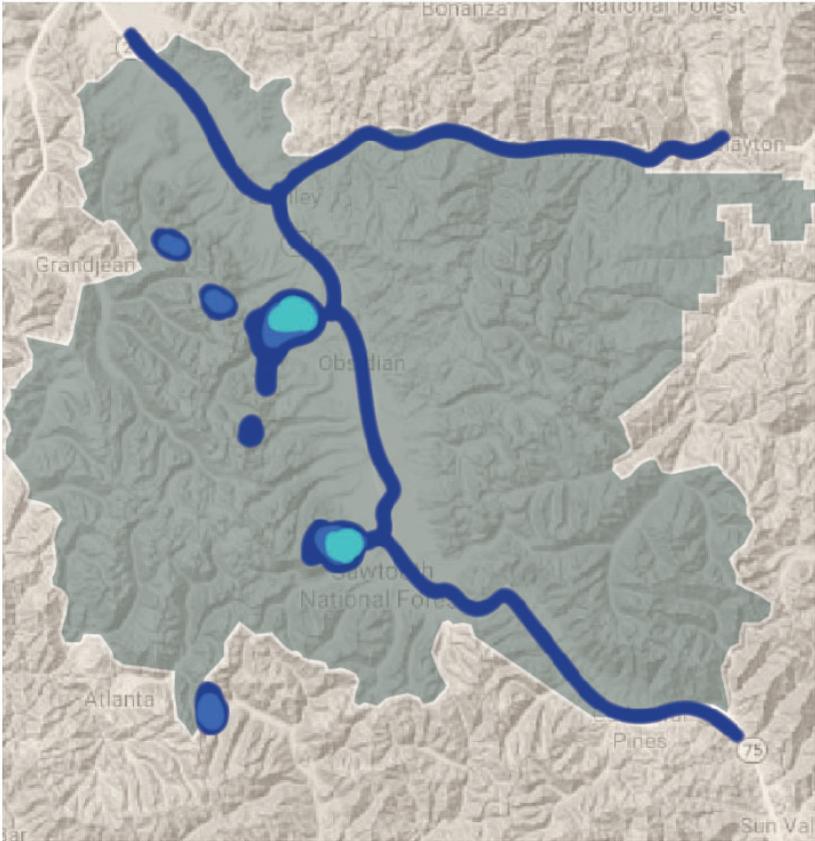


Figure 4.11: *Sawtooth Hashtag Heat Map*
(Hake, 2019)



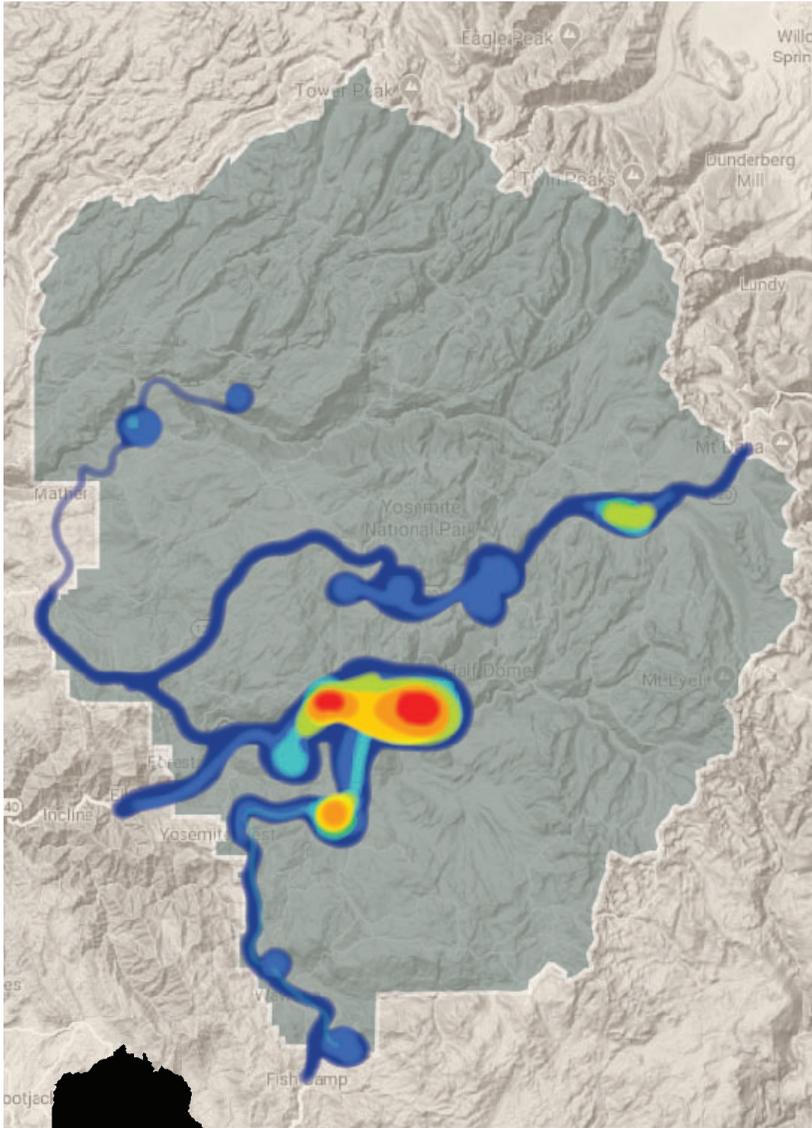


Figure 4.12: Yosemite Hashtag Heat Map
(Hake, 2019)

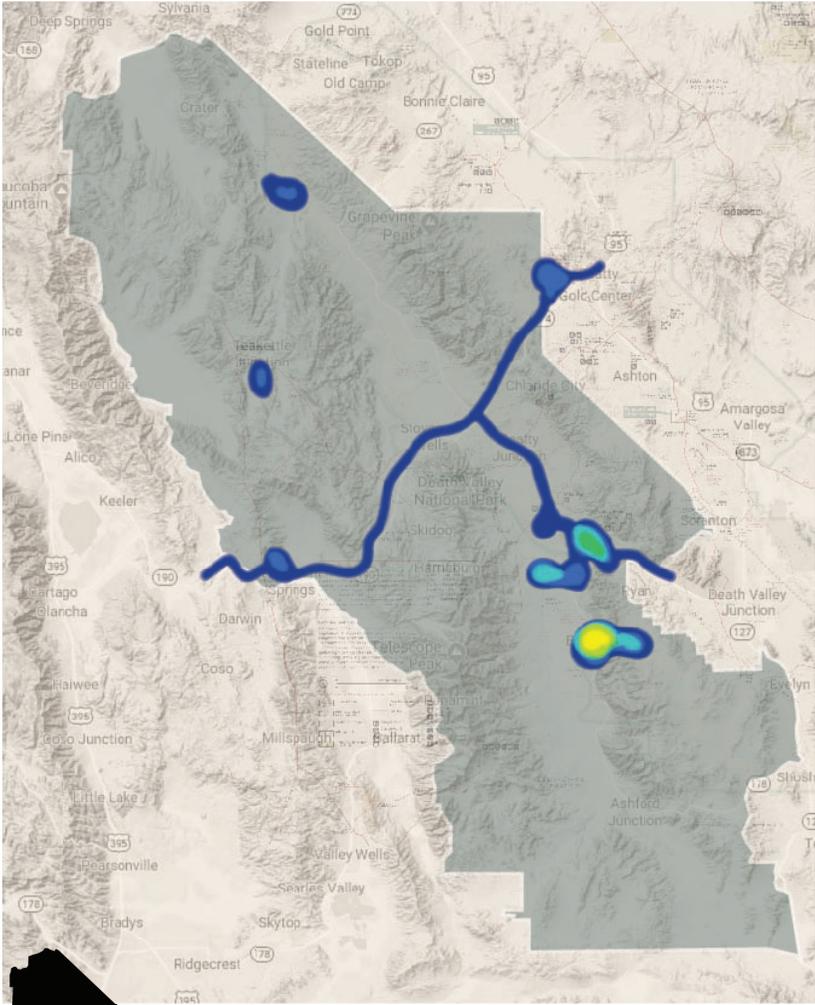


Figure 4.13: Death Valley Hashtag Heat Map (Hake, 2019)

Chapter five

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Design.05
App Tutorial



Design.05 This section is the transfer from findings to applied design knowledge for the prototype app as a tutorial



design

Background

As the earlier sections of the report described, national park visitation is at an all-time high, and it is thought that social media is a major driver of this recent popularity. For many reasons previously described, burgeoning visitation also places environmental stress on the parks as the National Park Service attempts to balance access for current and future generations with park resource protection. The initial research question was “how can social media and updated app technology be used to impact parks or other conservation projects in positive ways?” To this end, the objective Chapter 5: Design, is to propose how a new smartphone app could be tool to benefit both visitors and the parks through enhanced networking.

Parks Connect App

This report concludes by presenting a vision for a new smartphone app entitled “Parks Connect”. Developing and coding an actual working app is beyond the scope of this project, but a prototyped working interface is presented that illustrates the various functions that a working app would entail. The primary features of the app will be “Monitoring”, “Volunteering”, “Fundraising”, and “Entertainment”. These features draw upon what was learned from the existing app analysis, interviews with park staff involved with social media, and considering the historical context of park visitation and media campaigns. The prototype interface can be interactively reviewed at <https://xd.adobe.com/view/4c8f1cdd-a583-4adf-4d6e-9ee25a1b7b88-3abe/>. Each of the primary app features are illustrated and described in the

remaining chapter subsections.

Monitoring

The monitoring function of the app is split into informative communication from park employees as well as park-goers. Information provided by park employees can include park attendance, ecology and wildlife sightings (for caution and research purposes), safety practices for general visitors or backpacker safety, and of course the safe and responsible use of social media relating to national parks and our public lands. Other information provided by park-goers and other users of the app may include reporting maintenance issues, trail blockages, general park concerns, and potentially, a visitor-in-danger report function.

Volunteering

The volunteerism portion of the app serves as a portal for visitors to connect and access volunteer opportunities in the parks. Here, guests can see live postings for help needed at parks in their area and other ways to help or get involved. Active volunteers can see user reports for minor infrastructure

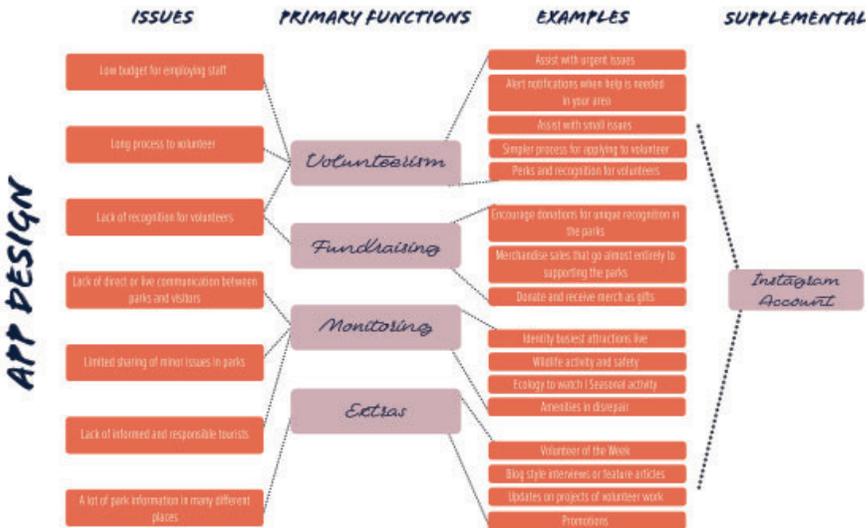


Figure 5.1: App Design Diagram (Hake, 2020)

repairs or other maintenance issues and assist in fixing them. Volunteers could also assist in documenting ecological functions such as sightings of invasive species.

Fundraising

The fundraising portion of the app can be used to promote different forms of encouraging donations to the park service. This could be in the form of a unique item, plaque, naming, or other recognition within the park. These recognition pieces could also be used to encourage and incentivize volunteerism. A certain level of volunteer participation (based on hours worked or special projects) could be allotted one of these spaces to acknowledge their time and dedication to the parks. Merchandise is also an easy way to encourage small donations to the parks. Within the fundraising portion of the app, merchandise may be featured to help get young people more active in contributing to parks. A high percentage of profit from merchandise such as clothing, equipment, and souvenirs can be returned as donations to the parks. These products can also be given to larger donors as a token of gratitude for their generosity.

Informational Entertainment

A positive addition to the app (particularly to get the word out about its functions) would be a promotional Instagram account. The purpose of the account would be to highlight significant portions of the app, show people how to use it, and showcase the good done and the results of these park connections. Posts can focus in on significant topics for safety in the national parks and public lands, they can be a spotlight on volunteer programs, show finished projects and those in the works, and promote the fundraising portion of the site.

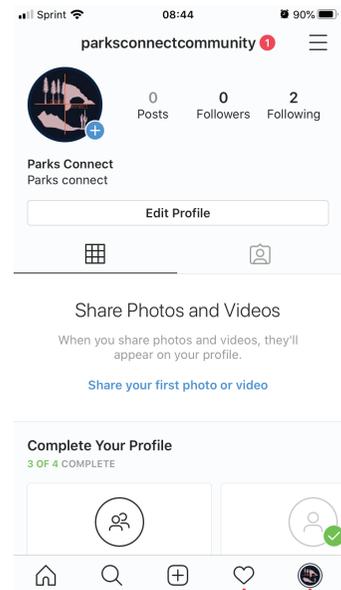


Figure 5.2: Instagram Account
(Hake, 2020)

Design.05

welcome to parks connect!



A multi-platform vision for connecting the public to their favorite parks in a fun and simple way.

Follow along with this tutorial to learn how to use and get the most out of the app!

Touch to begin.

Figure 5.3

This is the Parks Connect homepage. From here, you can access each of the 5 different primary sections of the app.

These sections include:

1. Explore

- This area allows the user to read about the parks, connect with other members, share their experiences, and communicate with the parks.

2. Monitor

- This section is about learning, connecting, and voicing your concern about the parks you have visited.

3. Volunteer

- This section gives users easier access to volunteer opportunities within the parks.

4. Support

- This section gives users quick access to support parks in any way they can.

5. My Parks

- This profile portion gives users a chance to customize their app experience and track their achievements with the parks.



Figure 5.4

Let's start with Explore.



Turn to the next page to learn about these actions.

Figure 5.5



Figure 5.6

In this section, users can select their favorite park and learn more about what makes each one special. Information found in these sections will include basic characteristics of the park (size, ecology, weather, landforms, etc.) as well as downloadable maps for offline use, hiking trails, and tips for planning a visit.

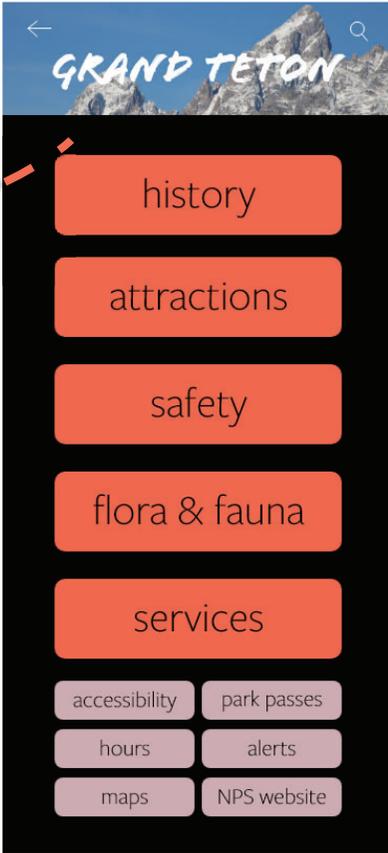


Figure 5.7

other parks:



Figure 5.8



Figure 5.9

Next: Explore Community

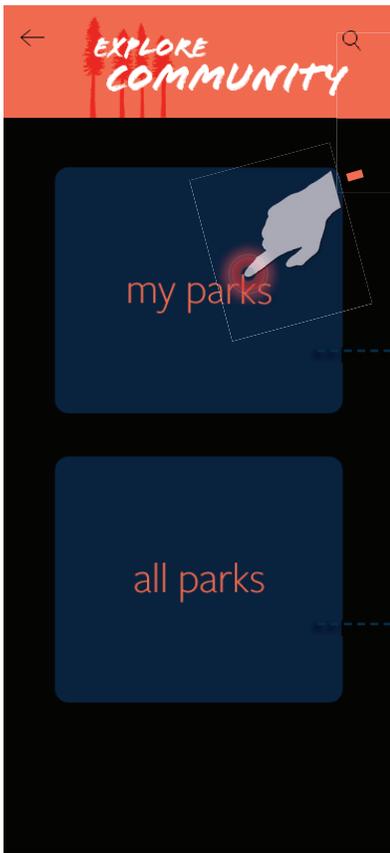


Figure 5.10

In the “Explore Community” page, users can follow parks they love and see live posts from other people in the Parks Connection community pertaining to their chosen parks.

This portion of the app is connected to Instagram to link user’s park posts and share them in the app.

By selecting “my parks” users see only the posts tagged in the parks that they have chosen to connect

By selecting “all parks” users can see posts pertaining to ALL parks in the Parks Connect community, and may add those of interest to their own feed.



Figure 5.11



action to add park to your feed

indicator that you are following this park

Figure 5.12

Next: Explore Learning, In Action, & Connections



Figure 5.13

“Explore Learning” is a section for sharing knowledge. Parks Connect controls this page, posting articles and information relevant to happenings in the parks. Topics for these articles can relate to park safety, political changes related to National Park Service, upcoming events, and other park happenings.



Figure 5.14

The purpose of “Explore In Action” is to showcase current volunteer and fundraising actions happening within the parks. Followers can keep up with actions they have been a part of and see actions that are currently underway.



Figure 5.15

“Explore Connections” is a place for park-goers to have a simpler, direct dialogue with those working in the park community. Comments and questions are filtered through the app and users can have real time conversations with rangers or volunteers.



Figure 5.16

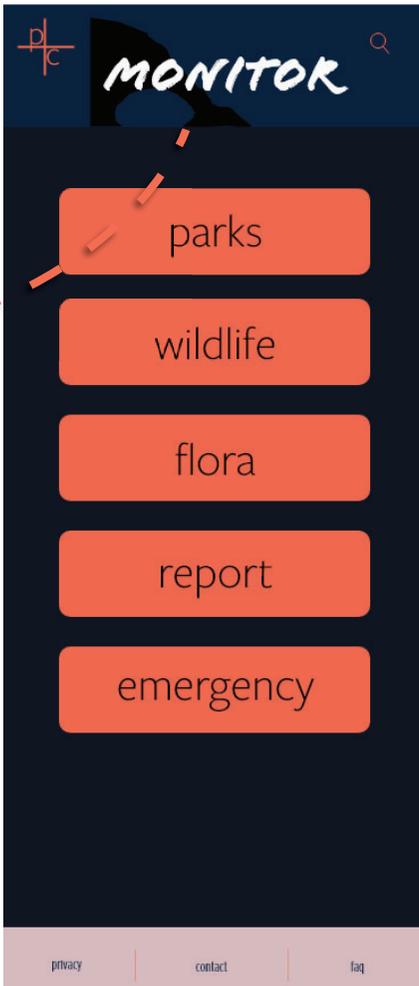


Figure 5.17

Next: Monitor



Figure 5.18



Turn to the next page to learn about these actions.

Figure 5.19



Figure 5.20

The purpose of this section is to allow park-goers to keep updated on what is happening in their favorite parks throughout the year. This includes emergency information, closures, weather, and more that may help tourists make responsible and safe travel plans.



Figure 5.21



Figure 5.22

Figure 5.23



Figure 5.24

Figure 5.25

“Monitor Wildlife” is a section for park employees and visitors to post sightings and current goings on with the wildlife in the parks. Visitors/Employees can see and post real time updates on animal sightings, areas to avoid, safety hazards, behaviors to look out for, and more.

“Monitor Flora” is a section for park employees and visitors to post sightings and current goings on with the vegetation in the parks. Visitors/Employees can see and post real time updates on flora sightings, educational information, seasonal blooms to watch, plants to avoid, tips for trekking responsibly, and more.

Next: Explore Report & Emergency



Figure 5.26

The “Monitor Report” section is dedicated to park goers who would like to report an issue in one of the parks to assist in monitoring the safety and health of the parks. Examples of issues to report may include fallen trees on paths, vandalism, lack of products in visitor facilities, and others.



Figure 5.27



Figure 5.28



Figure 5.29

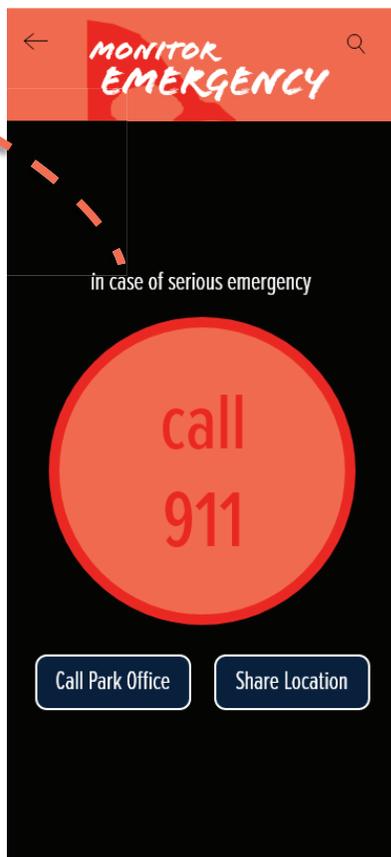


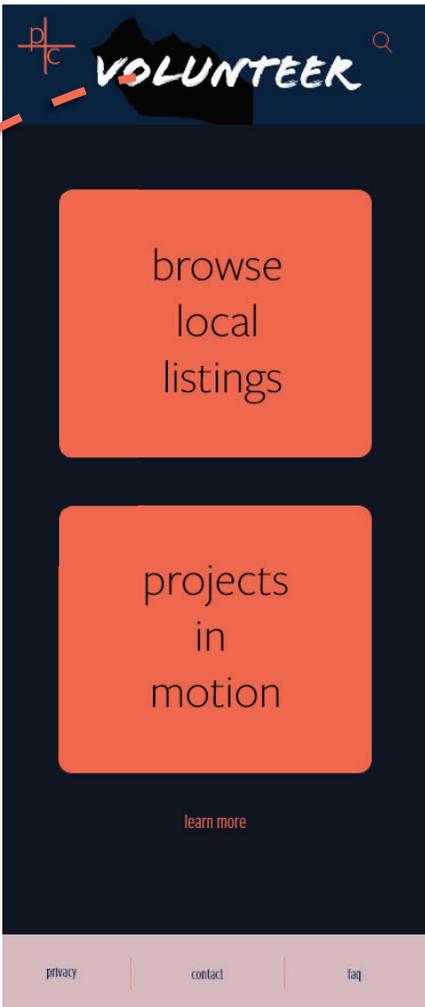
Figure 5.30

“Monitor Emergency” is an emergency call shortcut for park goers in need of serious police or medical attention while in the park. Using the iPhone’s location services, the emergency call will sync to the emergency number for the park you are closest to.

Next: Volunteer

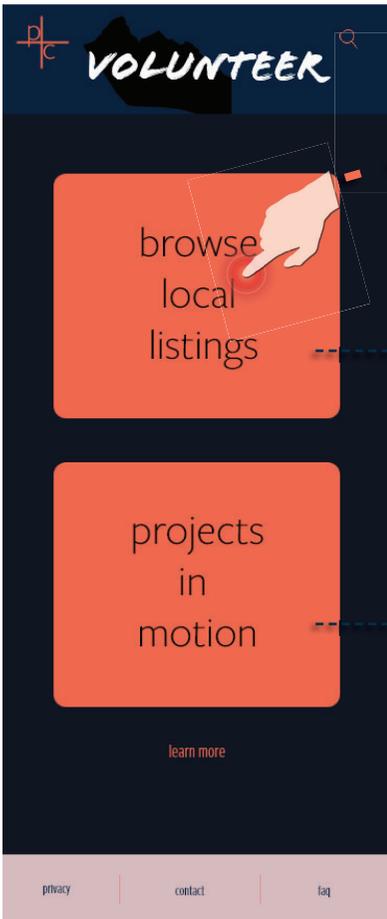


Figure 5.31



Turn to the next page to learn about these actions.

Figure 5.32



Here, app users can browse volunteer listings, save activities, or respond to them.

Projects in motion can help users learn about ongoing projects in the parks, as well as projects they have been involved in.

Figure 5.33

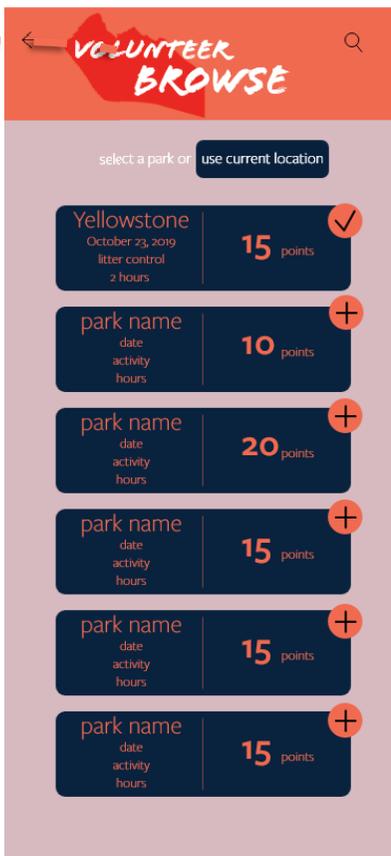


Figure 5.34

In the “Volunteer Browse” page, users can look for volunteer opportunities in their local parks to apply for. Users can also sign up to receive notifications from particular parks to be alerted when new volunteer opportunities are available. Theoretically, park personnel will sign off on your task once it is completed and it will be added to your achievements.

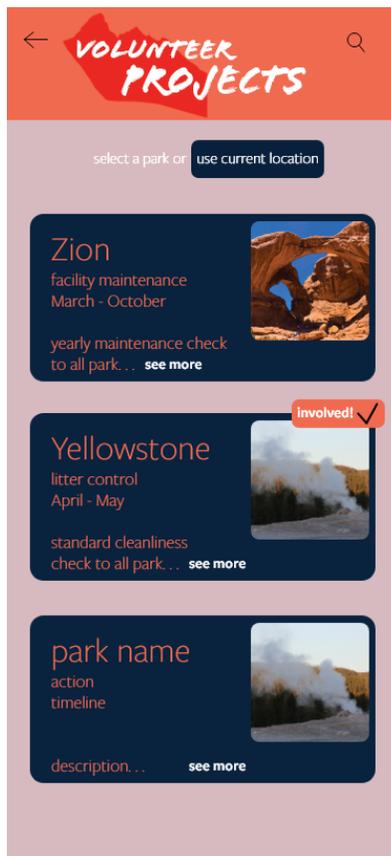
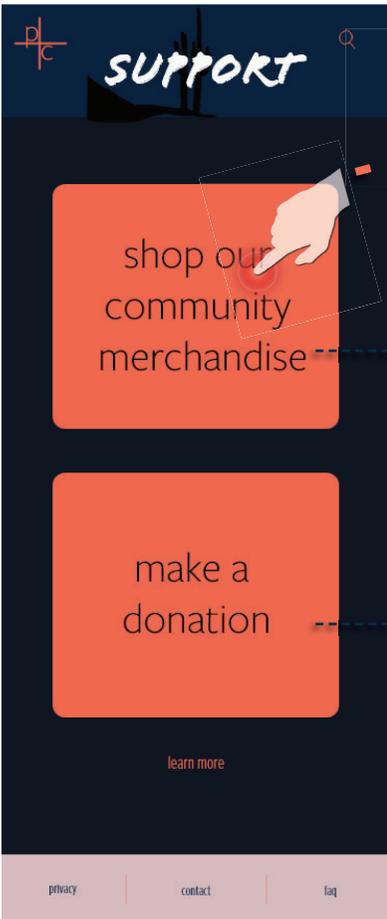


Figure 5.35

In “Volunteer Projects” users can see updates on long term projects going on in their favorite parks or see progress on past projects in which they have participated.

Next: Support



This section contains links to Parks Connect and other parks-related merchandise that benefits national parks with every purchase.

This section connects users to national park organizations and projects that need donations.

Figure 5.36



Figure 5.37



Figure 5.39

Figure 5.40

Figure 5.38

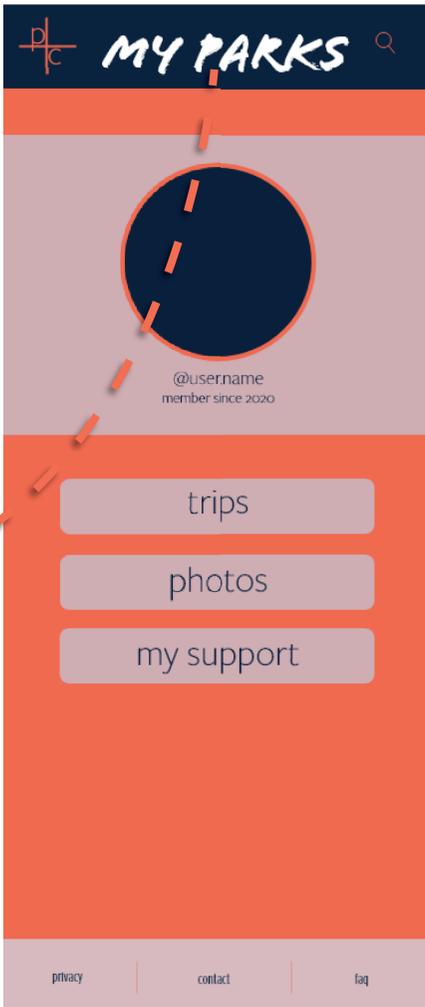
“Support Shop” lets users browse Parks Connect merchandise and other park-affiliated organizations that donate a portion of their proceeds to support national parks with every purchase. Each purchase will be added towards your donation achievements.

“Support Donate” is a straightforward place for users to see park requests for donations for particular projects or browse their individual foundations. Users can connect simply to any park they wish to support and will receive achievement points to their account based on the size or type of donation. Reaching higher goals in the achievements can reward the user with different types or recognition in the app, Instagram, or within the parks.

Next: My Parks



Figure 5.41



Turn to the next page to learn about these actions.

Figure 5.42



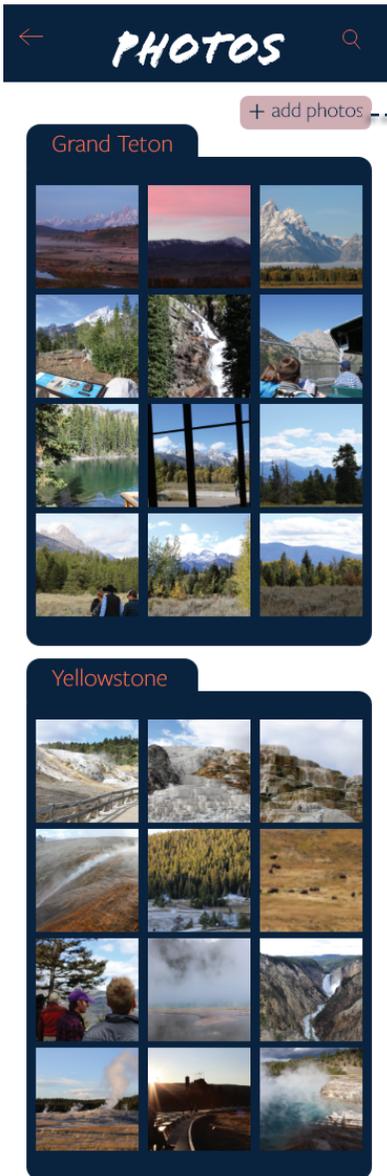
Figure 5.43

Preview of the trip includes the name of the trip, locations, dates, and campground. To see the whole itinerary, the user can tap “go to trip plan”.

Users can look at itineraries made by other people and organizations for their trip and write review for them.

Users can search for and follow friends to create collaborative itineraries or share their plans on other apps.

Users can use this section to organize and plan their next national park trip. Here, you can add multiple national parks to your itinerary, book campsites, and browse hikes or local activities to add to your trip. Users can also browse popular itineraries built by other users or Parks Connect as a base. They can even connect with friends to plan group trips.



Users can tap here to create an album or add more photos to an existing album.

The photos portion of “My Parks” is a place for users to organize and store their favorite photos from trips to national parks.

Figure 5.44

Next: My Support

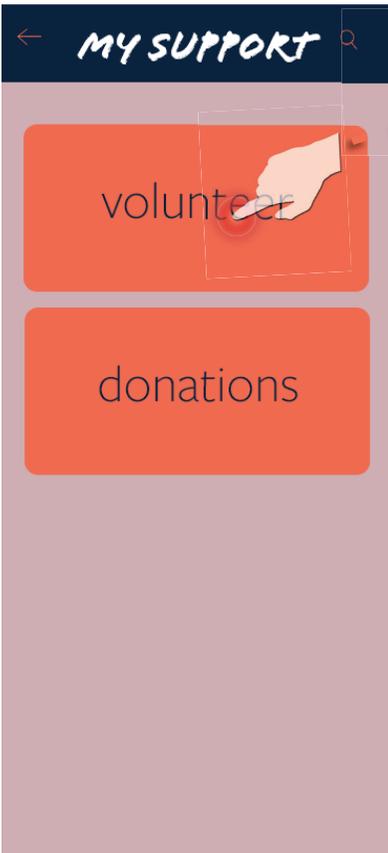


Figure 5.45

“My Support” tracks each user’s contribution to the parks whether it is through their volunteer work or financial contributions. The Support pages offer incentivizing goals for users to reach for their dedication. Certain levels may include prizes for the user or different levels of recognition from the app, through a bio on the app’s Instagram account, or in the parks through a partnership.



Figure 5.46

The “Volunteer” page tracks the user’s work log for the parks as well as the goal points awarded for each activity. Here you can view past volunteer work, upcoming work, and track your achievements.

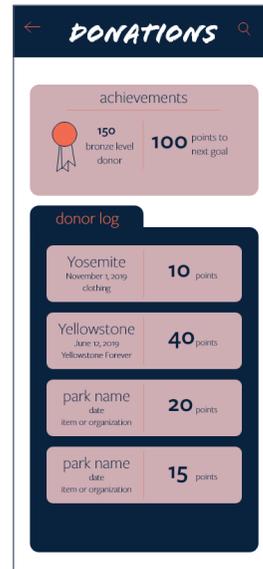


Figure 5.47

The “Donations” page tracks the user’s contributions log for the parks as well as the goal points awarded for each donation. Here you can view past donations, purchases made from park affiliated foundations, and track your achievements.

Donations can be monetary or in the form of buying merchandise that sends a percentage of their proceeds to supporting parks.

Chapter six

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Conclusion.06 Final Thoughts



Conclusion.06 This section will provide some final thoughts on the project and how future research may be conducted.



Conclusion.06

final thoughts

Project Significance & Outcomes

It is difficult to pinpoint the exact role social media has on tourism in our national parks. It is clear, however by looking at the timelines and visitation graphics, that social media appears to influence overall park visitation and trip planning and has the potential to exert even more influence. More people are turning away from traditional methods of acquiring information and instead rely on social media channels and other like-minded individuals expressing themselves online.

The research question this project explores relates to the future of positive visual communication:

“How can social media and updated app technology be used to impact the parks or other conservation projects in positive ways?”

During the interview with Jake Frank from Yellowstone National Park he mentioned how often people approach him about deleting the park's Instagram account and if he ever considered it. Their argument being that they worry social media attracts too many visitors to the parks. From the author's perspective, the larger issue is not to withdraw and maintain ample distance from the negative effects of a new social communication tool, but rather remaining a part of the conversation already taking place among visitors and the networked world. Deleting the account would not benefit the parks. It would not delete the problem or detract attention from the parks. Instead, it would remove the park's platform from the conversation. It is more important than ever that the right people are being heard through the noise. If Yellowstone removed themselves from the conversation, it would not stop the conversation from happening. It is better that the parks stay active in their use of social media and remain a part of the conversation to promote their message of health, safety, and natural resource education to the public. This argument is a big reason why it is so important to keep engaging and teaching through networked social media and smartphone applications. Instead of using the power of the network to promote "consumption of scenery", why not harness exponential network power to enable visitors to help extend the park service mission through greater personal engagement, resource monitoring, volunteerism, and financial contributions? As of right now there are no apps for exploring our parks that allow users to connect with the parks and each other. These features are paramount in creating something engaging and contributory. It is the chocolate to the informational broccoli – if you will – and will keep people coming back. Hopefully, implementation and deployment of the envisioned Parks Connect app would be a step in that direction.

Addressing Secondary Questions

How does history inform the future use of communication for the monitoring, funding, and ecologically conscious use of our national parks?

Combining education with fun and community is the best combination for engaging and seeing real results in improving the responsibility of tourists. The most popular media missions in history

(WPS, conservation projects with Ansel Adams, Mission 66, and Find Your Park) all had significant levels of interaction with park goers and activists.

Mass tourism may have a lot of negative impacts on park, but what are some positive effects?

Mass tourism has cons, but it also has its pros. **Visitation to the parks increases awareness and education of their conditions.** This education can help nurture the next generation of environmental stewards who will continue to protect our parks.

How would a “no tag rule” affect park visitation?

Social media, good or bad, has a huge impact on tourism.

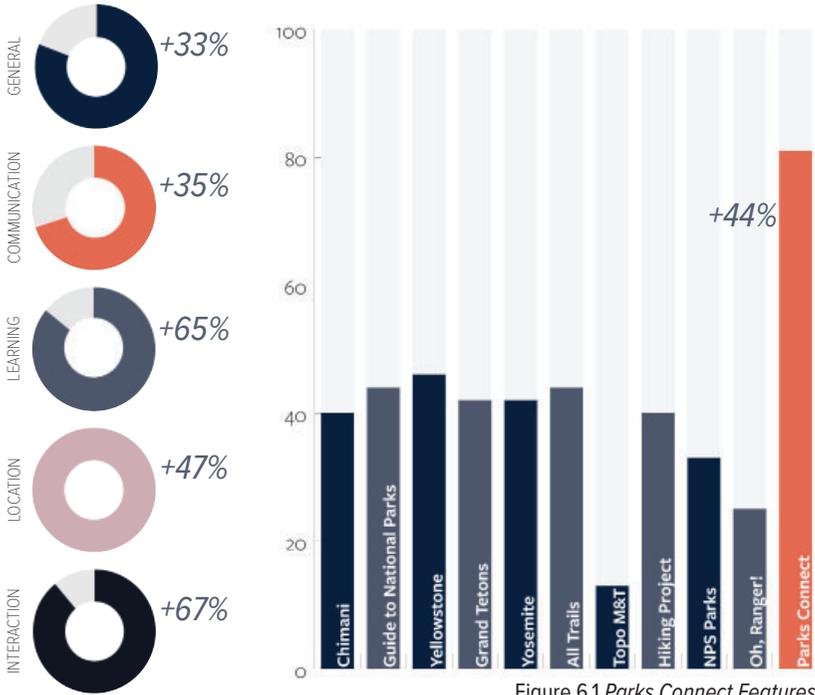
Dealing with such a new and rapidly evolving technology is tough but standing on the sidelines is not an option.

Practicing “sustainable social media” is an effective method for protecting the environment. This refers to “no tag” posting to social media, following the rules posted by parks, and uses the resources at hand (literally) to educate yourself before your visit.

How does policy and political legislation affect park use?

Tourism in our national parks is at a record high. The increased activity without intervention will eventually lead to the deterioration of these sacred places. Political leaders are in a crucial position for determining the future protection (or destruction) of the national parks and other public lands.

Parks Connect Features Against Existing Park Apps



*Percent improvement based on average

Figure 6.1 Parks Connect Features
(Hake, 2020)

How Does Parks Connect Compare?

Based on the research for this project, Parks Connect would outperform each tested park app. Parks Connect combines the best features from existing apps, envisions new features that have never been used for parks, and would provide exciting content to encourage users to return to the app. These updates along with the improved look and usability ensures its success. It has the potential to be the new one-stop for communicating with, learning about, and supporting our national parks. It is important to note that the goal of Parks Connect was not to reach 100% capability among the app features. The goal was to create an app that would outperform existing apps, with the most relevant features, in an innovative and fun new way.

This project is not to suggest that the National Park Service's current

operations are inadequate or ineffective. Because technology changes so quickly, NPS may not have the current manpower to keep up. The NPS website and current apps contain a lot of great information but streamlining information and better connecting with their audience can only help. Adding a competitive edge and incentive to park donations and volunteerism can rapidly increase interest and activity. Linking those actions to social media and sharing those achievements keep the wheel turning.

Time was the biggest limitation for this project. This is such a rich and broad-spanning project, that if more time were available, much more extensive work could benefit and improve this topic. However, in the given timeframe, this project was successful in providing topical and original data for informing a new type of app that is much more inclusive and informative than any park app that preceded it. Of course, right now it is only a prototype, but with the right programming and continued research it could become the next great national parks app.

Project Limitations

Each of the methods, though effective for now, had their own set of limitations that could be remedied if the project were to be repeated or expanded upon.

Historical Analysis Limitations

Although a correlation may exist between increases in park visitation and NPS media campaigns and U.S. historical events, a direct link or causal relationship will remain conjecture. For more recent events, other methods like surveys might hold statistical significance, but are beyond the scope and timeframe of this report.

Interview Limitations

The biggest limitation of the interviews conducted with media representatives of the three study parks was that the information was reflective of limited viewpoints and personal experiences. Because the parks operate on their own terms, data collected from Yellowstone and Yosemite cannot be the assumed standard for all parks. Another issue with the interviews was communication and timing. It was difficult to get in contact with the right NPS employees that could provide relevant responses to the questions. For this reason, there were only two interviews conducted.

Media Analysis Limitations

No issues were encountered with the app analysis. It was a simple function comparison and the results were directly applied to the prototype app. The aesthetic and functionality reviews were entirely based on the single opinion of the author.

Hashtag Analysis Limitations

There was a lot of room for error in the hashtag heat mapping . The photos may be tagged improperly causing the results to be skewed, or photos can be “overtagged” meaning a photo of the entrance of the park could be tagged with over twenty hashtags even if they are not shown in the photo. The mapping portion was generated as the best effort by the author. Because no actual mapping technology exists for this kind of analysis, the maps were generated from scratch and adjusted by hand, allowing room for human error. Lastly, the number of posts is a broad generalization. Hashtags with fewer than 100 posts were not added to the totals, nor were hashtags that may have been unrelated to the actual post. Hashtag locations were also dependent on cellular data availability and range.

Future Research

This is such an emerging topic and more data is available every day while new solutions for problems are constantly forming. Because of this, future research and continuation for this project is extremely broad and the ever-changing nature of technology means it may never stop evolving.

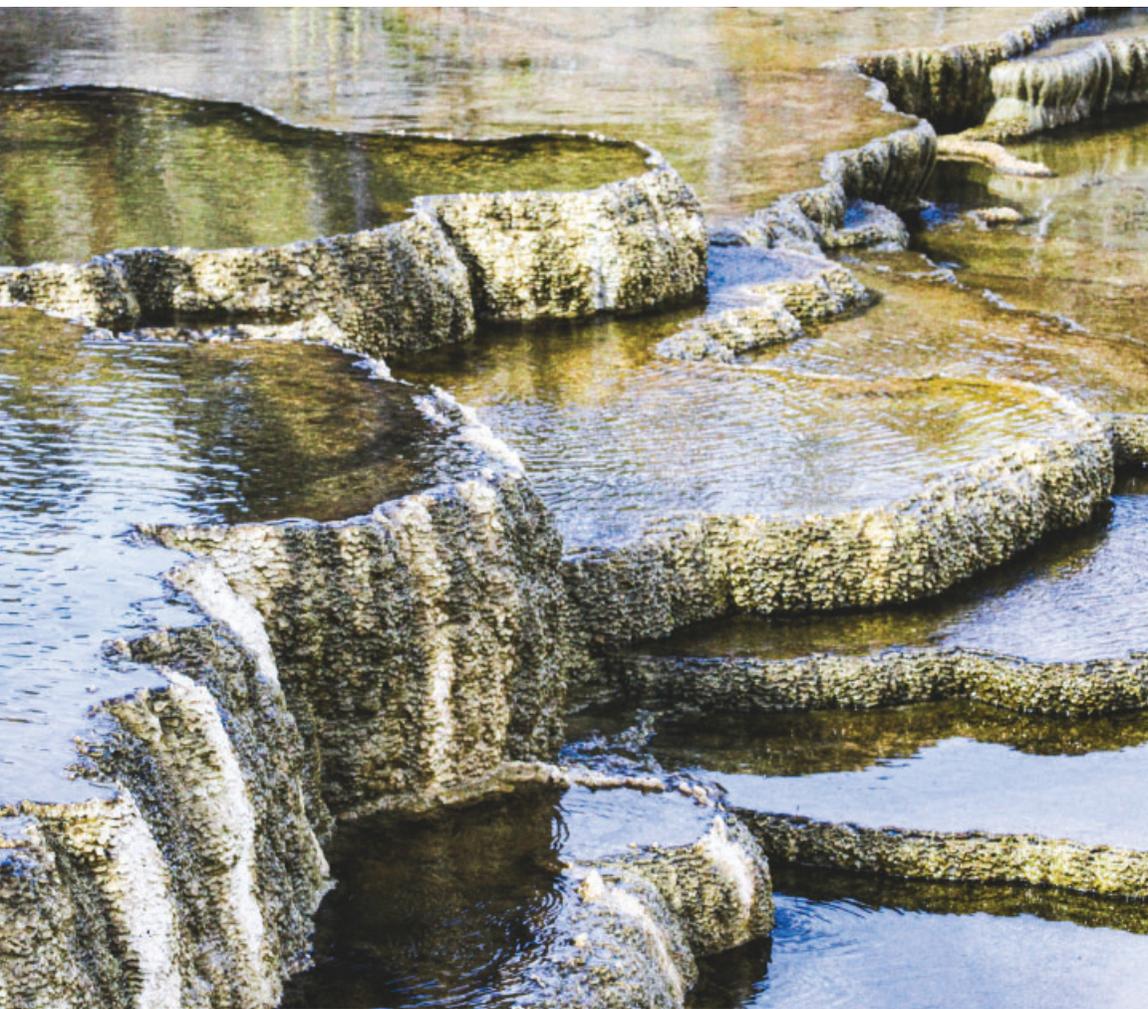
An obvious area for continuation will be the coding and publishing of a final Parks Connect app. If the app is ever implemented with help of a private partner of the parks or within the NPS itself, it would need to be properly vetted with the parks to assure it aligns with their own goals and mission. This would mean making a clearer and deeper connection between the NPS and the app. Certain characteristics of the app are intentionally vague to allow for alterations but moving forward those aspects would have to be better defined. There needs to be a clear hierarchy of control of the app and who specifically will be connecting with the public through the app's portals would have to be identified. The app can also be taken to the next level simply by filling in the blanks and adding more parks to the mix. This could also mean going beyond the NPS. Broadening the scope of which parks are included in the app can diversify the content.

Project Reflection

The methodology and research planned for this project has successfully informed the design and function of a new app for national parks. This app creation was reached through the culmination of research in the form of: literature review, historical analysis, media and hashtag data analysis, interviews, and ended with design.

Creating places that can be visited and enjoyed responsibly is a big part of landscape architecture. Landscape architects are concerned about wildlife, vegetation, and the planning and conservation of our public lands. Knowledge about what influences a visitor's choice to come to a place can help inform design, future strategies for bringing people to parks or public spaces, and the healthy regulating of that visitation.

Appendices



references

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Appendix A

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Figure 1.0: Hake, Bridget. (2019).Meadow and Tetons. Photo

Figure 1.1: Hake, Bridget. (2019).Research Outline Diagram. Adobe Illustrator.

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Appendix B

graphs & tables

MEDIA ANALYSIS

GENERAL SCORES

| Multiple Parks: Mapping | Downloads | Personalizatic Photos | Weather | Live Activity | Link to NPS | Offline | More than NP | Photo Collage Tours | Accessibility | Services | Schedules | IAP |
|-------------------------|-----------|-----------------------|---------|---------------|-------------|---------|--------------|---------------------|---------------|----------|-----------|-----|
| X | X | X | X | | X | | | | | | | X |
| X | X | X | | X | X | X | X | | | | | |
| | X | X | X | | X | X | | X | X | X | X | X |
| | X | X | X | | X | X | | X | X | X | X | X |
| X | X | X | X | X | | X | X | | | | | X |
| X | X | X | | | | | X | | | | | X |
| X | X | X | | X | | | X | | | | | X |
| X | X | | X | X | | X | X | | | | | X |
| X | X | | X | X | X | | X | | | | | X |
| X | X | X | X | X | X | X | X | | X | X | X | X |

| App | Totals | Percent of Criteria |
|------------------|--------|---------------------|
| 1 Chimani | 7 | 44% |
| 2 Guide to Natic | 8 | 50% |
| 3 Yellowstone | 11 | 69% |
| 4 Grand Tetons | 10 | 63% |
| 5 Yosemite | 10 | 63% |
| 6 All Trails | 10 | 63% |
| 7 Topographic I | 3 | 19% |
| 8 Hiking Project | 7 | 44% |
| 9 NPS Parks | 6 | 38% |
| 10 Oh, Ranger! | 5 | 31% |
| Parks Connec | 13 | 81% |
| average | | 48% |

General Definitions

Multiple Parks: Does the app feature information about more than one park?

Mapping: Does the app offer different mapping features?

Downloads: Is there content available for download?

Personalization: Does the app react to a user's account, selected preferences, or location?

Photos: Does the app feature pictures of destinations or allow users to upload their own photos?

Weather: Does the app provide current weather conditions for the park?

Live Activity: Does the app allow users to see how busy the park is in a live format?

Link to NPS: Does the app connect to the NPS for additional information and planning guides?

Offline: Is the app accessible offline?

More than NP: Does the app feature parks and trails outside of National Parks Land?

Photo Collage: Does the app offer fun content creation for photos taken within the park?

Tours: Does the app offer self-guided audio/visual tours for users in the park?

Accessibility: Does the park offer information and recommendations based on accessibility?

Services: Does the app offer recommendations and information on a park's services?

IAP: Are there deals or items available for purchase within the app (clothing, tours, upgrades, etc.)?

Schedules: Does the app provide users with schedules of the goings on in the parks?

COMMUNICATION SCORES

| UGC | 2 Way Comm Ratings | Sharing | Tips | Emergency Se | Notifications | FB Connect | Garmin |
|-----|--------------------|---------|------|--------------|---------------|------------|--------|
| | | X | X | | X | X | |
| | X | X | X | X | | X | |
| | | X | X | | X | | |
| | | X | X | | X | | |
| X | | X | X | | X | X | X |
| | | X | X | | | X | |
| X | | X | X | X | | | |
| | | | X | | | | |
| X | X | X | X | X | X | | |

| App | Totals | Percent of Criteria | |
|-----------------------------|--------|---------------------|---------|
| 1 Chimani | 4 | 40% | |
| 2 Guide to National Parks | 5 | 50% | |
| 3 Yellowstone | 3 | 30% | |
| 4 Grand Tetons | 3 | 30% | |
| 5 Yosemite | 3 | 30% | |
| 6 All Trails | 6 | 60% | |
| 7 Topographic Maps & Trails | 6 | 60% | average |
| 8 Hiking Project | 0 | 0% | 35% |
| 9 NPS Parks | 4 | 40% | |
| 10 Oh, Ranger! | 1 | 10% | |
| Parks Connect | 7 | 70% | |

Communication Definitions

UGC: Is there dedicated space on the app for User generated content? Are users able to upload their thoughts, recommendations, etc.?

2 Way Communication: Is there a place for users to connect with the app creators or parks employees to ask questions, share opinions, or other?

Location Tracking: Can the user see their location on the app's map?

Ratings: Can users rate given destinations or features on the app?

Sharing: Can users share trails, accomplishments, locations, etc. on the app?

Tips: Does the app offer tips for given destinations or trails for traveling, usage, how to get there, etc.?

Emergency Service: Does the app provide access to emergency response, 911, precise offline location for help?

Notifications: Does the app offer notifications for emergency services, weather, or other live information relevant to the user?

FB Connect: Does the app connect to Facebook?

Garmin: Does the app connect to Garmin for tracking?

Apple Health: Does the app connect to Apple Health for tracking?

LOCATION SCORES

| Location tracking | Location Rec | Activity Recor | Check-ins | Navigation | Activity Tracking |
|-------------------|--------------|----------------|-----------|------------|-------------------|
| X | X | | X | | |
| X | X | X | | | |
| X | X | X | | | |
| X | X | X | | | |
| X | X | | | X | X |
| X | | | | | X |
| X | X | X | X | X | X |
| X | X | X | | X | |
| X | X | X | | X | |
| X | X | X | X | X | X |

| App | Totals | Percent of Criteria | | |
|------------------------------------|--------|---------------------|---------|-----|
| 1 Chimani | 0 | 0% | | |
| 2 Guide to National Parks | 3 | 50% | | |
| 3 Yellowstone | 3 | 50% | | |
| 4 Grand Tetons | 3 | 50% | | |
| 5 Yosemite | 3 | 50% | average | 53% |
| 6 All Trails | 4 | 67% | | |
| 7 Topographic Maps & Trails | 2 | 33% | | |
| 8 Hiking Project | 6 | 100% | | |
| 9 NPS Parks | 4 | 67% | | |
| 10 Oh, Ranger! | 4 | 67% | | |
| Parks Connect | 6 | 100% | | |

Location Definitions

Location Recommendations: Does the app recommend places to visit based on the user's current location?

Activity Recommendations: Does the app offer activities based on the parks the user is searching and/or places to visit based on the user's preferred activities?

Check-ins: Does the app allow the user to check in to a location for other users to see?

Navigation: Does the app offer navigation within the park, its trails, or to get to the park?

Activity tracking: Does the app offer features for recording an activity in a park?

INTERACTIVE SCORES

| Lodging Info | Trip Planning | Profile | Incentive | Savings | Volunteer link | donations | collaborative trips |
|--------------|---------------|---------|-----------|---------|----------------|-----------|---------------------|
| X | X | X | X | X | | | |
| X | X | X | | | | | |
| | X | | | | | | |
| X | X | | | | | | |
| X | X | | | | | | |
| | X | | | | | | |
| | | X | | | | | |
| | X | X | | | | | |
| | X | | | | | | |
| X | X | X | X | | X | X | X |

| App | Totals | Percent of Criteria | | |
|-----------------------------|--------|---------------------|---------|-----|
| 1 Chimani | 5 | 56% | | |
| 2 Guide to National Parks | 3 | 33% | | |
| 3 Yellowstone | 1 | 11% | | |
| 4 Grand Tetons | 2 | 22% | | |
| 5 Yosemite | 2 | 22% | average | 22% |
| 6 All Trails | 1 | 11% | | |
| 7 Topographic Maps & Trails | 1 | 11% | | |
| 8 Hiking Project | 2 | 22% | | |
| 9 NPS Parks | 2 | 22% | | |
| 10 Oh, Ranger! | 1 | 11% | | |
| Parks Connect | 8 | 89% | | |

Interactive Definitions

Lodging info: Does the app offer information for where to stay in a park, campgrounds, booking, or other information about overnight conditions.

Trip Planning: Does the app allow users to save parks, hikes, etc. to plan their own personalized trips?

Profile: Does the app allow users to create a profile for saving information about your travels and app activity?

Incentive: Does the app offer points (or similar) for completing trips or hikes with the app?

Volunteer Link: Does the app have a connection to the park's volunteer services or opportunities?

Donations: Does the app feature a section for users to support parks via donation or through purchasing foundation merchandise?

Collaborative Trips: Does the app allow users to connect and plan trips with friends?

Achievement Perks: Does the app offer incentive for supporting or volunteering within the parks?

LEARNING SCORES

| Webcams | LNT | History | Wildlife | Itinerary | Safety | Articles |
|---------|-----|---------|----------|-----------|--------|----------|
| | X | | | | X | |
| X | | | | | X | |
| X | | X | X | | X | |
| | | X | | | X | |
| | | | | X | X | |
| | | | X | | | X |
| | X | X | X | X | X | X |

| App | Totals | Percent of Criteria | |
|------------------|--------|---------------------|------|
| 1 Chimani | 2 | 29% | 71% |
| 2 Guide to Natic | 2 | 29% | 71% |
| 3 Yellowstone | 4 | 57% | 43% |
| 4 Grand Tetons | 2 | 29% | 71% |
| 5 Yosemite | 2 | 29% | 71% |
| 6 All Trails | 0 | 0% | 100% |
| 7 Topographic I | 0 | 0% | 100% |
| 8 Hiking Project | 0 | 0% | 100% |
| 9 NPS Parks | 2 | 29% | 71% |
| 10 Oh, Ranger! | 1 | 14% | 86% |
| | | | 0% |
| Parks Connec | 6 | 86% | 14% |
| | | average | 21% |

Learning

Webcams: Does the app feature live footage via webcam of the park?

LNT: Does the app offer information about Leave No Trace and how to use the parks responsibly?

History: Does the app provide information about the history of the given park and its significance?

Wildlife: Does the app provide information on the wildlife local to the individual parks?

Itinerary: Does the app provide pre-made itineraries and recommendations to users?

Safety: Does the app provide safety information and tips for traveling, hiking, staying in, or using the parks?

Articles: Does the app feature links or connections to articles or news relevant to the parks?

HASHTAG ANALYSIS

YOSEMITE NATIONAL PARK

DEATH VALLEY NATIONAL PARK

PINNACLES NATIONAL PARK

California

| Park Name | Tagged Location | Hashtag | # of Posts | Primary Attraction | |
|---------------------------------|---------------------------------|---|---|--------------------|--|
| Yosemite National Park | Yosemite | #yosemite, #yosemitenationalpark | 3.8 M | | |
| | Bridalveil Falls | #bridalveillfalls, #bridalveilfall, #halfdome, #halfdomecables, | 124 K | | |
| | Half Dome | #halfdome, #halfdomecables, | 406 K | | |
| | El Capitan | #elcapitan | 301 K | | |
| | Mariposa Grove | #mariposagrove | 20 K | | |
| | Wawona Visitor Center | #wawona, #wawonacampground, #inspirationpointhike, #inspirationpointtrail | 6 K | | |
| | Inspiration Point | #hetchhetchy, #hetchhetchyvalley, #tueeulafalls, #tueeulafall, | 1 K | | |
| | Hetch Hetchy | #hetchhetchy, #hetchhetchyvalley, #tueeulafalls, #tueeulafall, | 14.5 K | | |
| | Tueeulala Falls | #tueeulafalls, #tueeulafall, | 300 | | |
| | Wapama Falls | #wapamafalls | <100 | | |
| | Rancharia Falls | #ranchariafalls | 1 K | | |
| | Yosemite Creek | #yosemitecreek, #yosemitecreekcamprou | 1 K | | |
| | Porcupine Flat | #porcupineflats, #porcupineflatcampgroun | 300 | | |
| | Olmsted Point | #olmstedpoint, #olmstedfalls | 10 K | | |
| | Tuolumne Meadows Visitor Center | #tuolumnemeadows, #tuolumnecounty | 42.5 K | | |
| | Vogelsang | #vogelsang | 12.1 K | | |
| | Glacier Point | #glacierpoint, #glacierpointyosemite | 133 K | | |
| | Mist Trail | #misttrail | 37.6 K | | |
| | Nevada Fall | #nevadafalls | 50.7 K | | |
| | Four Mile Trail | #fourmiletrail | 1 K | | |
| | Upper Yosemite Falls | #upperyosemitefalls, #upperyosemitefallstrail, | 15.2 K | | |
| | Mono Pass | #monopass, #monopasstrail | 1.1 K | | |
| | Glen Aulin | #glenaulin, #glenaulintrail, olenaulinfalls | 1.2 K | | |
| | Clouds Rest | #cloudsrest, #cloudsresttrail | 23 K | | |
| | North Dome | #northdome, #northdomehike, | 5.2 K | | |
| | Mirror Lake | #mirrorlake, #mirrorlakeyosemite | 193.5 K | | |
| | Death Valley National Park | Death Valley NP | #deathvalley, #deathvalleynationalpark, | 1 M | |
| | | Badwater Basin | #baswaterbasin, #badwaterbasindeathvall | 58.1 K | |
| | | The Race Track | #deathvalleyracetrack, #racetrackdeathvalley, | 2 K | |
| | | Zabriskie Point | #zabriskiepoint | 41.4 K | |
| | | Dantes View | #dantesview | 22.4 K | |
| Artists drive & Artists Palette | | #artistsdrive | <5000 | | |
| Devils golf course | | #devils golfcourse, #devils golf, | 15.5 K | | |
| Harmony Borax Works | | #harmonyborax, #harmonyboraxworks, | <500 | | |
| Twenty Mule Team Canyon | | #twentymuleteamcanyon, #twentymuleteam | <500 | | |
| Father Crowley Point | | #fathercrowleypoint, #fathercrowley, #ubehel, | <1000 | | |
| Ubehebe Crater | | #ubehelcrater | <100 | | |
| Rhyolite Ghost Town | #rhyoliteghosttown | <5000 | | | |
| Pinnacles National Park | Pinnacles National Park | #pinnaclesnationalpark, #pinnaclesnationalmonu | 60 K | | |
| | Bear Gulch Cave | #beargulch, #beargulchcave | <2000 | | |
| | Moses Spring Trail | #mosestrail | <100 | | |
| | High Peaks | #highpeaks pinnacles | <100 | | |
| | Resurrection Wall | #resurrectionwall | <100 | | |
| | Machete Ridge | #macheteridge | <100 | | |
| Balconies Cave Trail | #balconiescavetrail | <500 | | | |

GRAND TETON NATIONAL PARK

YELLOWSTONE NATIONAL PARK

SAWTOOTH NATIONAL RECREATION AREA

Montana/Wyoming

| Park Name | Tagged Location | Hashtags | # of Posts | Primary Attraction |
|-----------------------------------|---|--|----------------------------------|--------------------|
| Grand Teton National Park | Grand Teton | #grandtetonnationalpark, #grandteton | 568 K | |
| | Craig Thomas Discovery and Visitor Center | #craigthomasdiscoveryvisitorcenter, | 300 | |
| | Jenny Lake | #jennylake, #jennylakebodge, | 36.2 K | |
| | Taggart Lake | #taggartlake, #taoqartlake trail | 1.5 K | |
| | Colter Bay | #colterbay, #colterbayvillage, #laurencestrockefellerpreserve, #sprserve | 5.6 K | |
| | LSR | #lsr | 300 | |
| | Jackson Lake | #jacksonlake, #jacksonlakebodge | 31.7 K | |
| | Signal Mountain | #signalmountain, #signalmountainlodg | 25.2 K | |
| | Cascade Canyon Trail | #cascadecanyon, #cascadecanyontrail | 5.5 K | |
| | Teton Crest | #tetoncrest, #tetoncrest | 1.1 K | |
| | Death Canyon | #deathcanyon, #deathcanyontrail | 1.1 K | |
| | Painbrush Canyon | #painbrushcanyon, #painbrushcanyontrail | 1.3 K | |
| | Leigh Lake | #leighlake, #leighlake trail | 1.1 K | |
| | Hermitage Point | #hermitagepoint, #hermitagepoint trail | 200 | |
| | Alaska Basin | #alaskabasin, #alaskabasin trail | 1.3 K | |
| | Granite Canyon | #granitecanyon, #granitecanyon trail | 600 | |
| | Yellowstone National Park | Phelps Lake | #phelps lake, #phelps lake trail | 5.1 K |
| Yellowstone | | #yellowstone national park, #yellowstone, #artspoint, | 2 M | |
| Arist Point | | #artspoint, #westthumb, | 24.1 K | |
| West Thumb | | #westthumb, #westthumbgeyserbasin | 6 K | |
| Old Faithful | | #oldfaithful, #oldfaithfulgeyser | 159 K | |
| Norris Geyser Basin | | #norrisgeyserbasin, #norrisgeyser, | 5.6 K | |
| Roaring Mountain | | #roaringmountain | 100 | |
| Mammoth Hot Springs | | #mammothhotsprings, | 34.9 K | |
| Roosevelt Arch | | #rooseveltarch, #rooseveltarchyellowsto | 1.1 K | |
| Albright Visitor Center | | #albrightvisitorcenter | <100 | |
| Sawtooth National Recreation Area | Sawtooth National Rec Area | #sawtoothmountains | 49.9 K | |
| | Fishhook Creek | #fishhookcreek, #fishhookcreek trail | <500 | |
| | Saddle Back Lakes | #saddlebacklake, #saddlebacklakes | <500 | |
| | Goat Lake | #goatlake, #goatlake trail | <1000 | |
| | Thompson Peak | #thompsonpeak | <5000 | |
| | Redfish Lake | #redfishlake | 19.8 K | |
| | Sawtooth Lake | #sawtoothlake | <5000 | |
| | Imogene Lake | #imogenelake | <500 | |
| | Bench Lakes | #benchlakes | <500 | |
| | Alice Lake | #alicelake | 12 K | |
| | Decker Peak | #deckerpeak | <100 | |

Appendix C

interview materials

IRB APPROVAL



University Research Compliance Office

TO: Dr. Howard Hahn
Architecture, Planning, and Design
2103 Seaton Hall

Proposal Number: 10045

FROM: Rick Scheidt, Chair 
Committee on Research Involving Human Subjects

DATE: 02/06/2020

RE: Proposal Entitled, "Social (media) Change: Evaluating Advertisements in National Parks and Exploring Options for Positive Media"

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written - and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: 2, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

INTERVIEWEE COVER LETTER

Hello, I am sending you this request to be interviewed as I am studying media and social media impacts on National Parks for my master's project in Landscape Architecture. My name is Bridget Hake, and I am a fifth year and graduate student in Landscape Architecture at Kansas State University.

For my final year in the program I am required to develop a master's report relating to areas of study within Landscape Architecture. I have always been interested in the National Park Service and Tourism, and recently I have seen a lot of news about the devastation of our public lands supposedly due to social media. These stories have led me to pursue a master's project focused on the impacts of media and finding the potential its potential for good. This has led me to select 3 parks- Yosemite, Grand Tetons, and Yellowstone- as examples for my project. My hopes are to compare how media has impacted each of these parks through the years and find areas where media and app technology can improve social media and tourism culture in the National Parks.

The main question of my report is: *"How can social media and updated app technology be used to impact the parks or other conservation projects in positive ways?"* My project is four part: 1) Historical Analysis of Media 2) Interviews 3) Analysis of Modern Media 4) Prototype App Design. The expected duration of the interview is approximately 30 minutes and will be arranged at your convenience. The interview questions to be asked are attached for your review, but overall the interview will be a meeting via phone, video, or email to help me learn more about the role social media and other ad campaigns are currently playing in the parks. Permission has already been granted from the Kansas State Institutional Review Board (IRB) for conducting interviews. I am also asking permission to include your name in my report. Also, I am asking permission to record our discussion to accurately document the interview for my own reference later in the project. If you would prefer to stay anonymous or not be recorded, I will respect that and keep the conversation confidential. Participation in this interview is voluntary, and you are free to leave or refuse to participate at any time before or during the interview.

I know you are a busy professional. I greatly appreciate your help, experience, and knowledge so that I can strengthen my master's report. I hope that the report will ultimately influence future development in the National Park System and be helpful in the implementation of positive media action that will be mutually beneficial to staff and park-goers alike.

Thank you in advance for your willingness to help.
Bridget Hake
Kansas State University
Graduate Student in Landscape Architecture
bhake07@ksu.edu | 402.968.4163

INTERVIEW QUESTIONS

Bridget Hake

Major Professor: Howard Hahn

8 February 2020

SOCIAL (media) CHANGE:

Evaluating Advertisements in National Parks and Exploring Options for Positive Media

Interview Questions

1. What does a typical day look like in your role in tourism communication or interacting with tourists? How much direct involvement do you have with creating/directing social media and how large is your staff?
2. What are some of the opportunities and challenges faced by you in your position related to increased tourism?
3. Is there a difference in the opportunities and challenges when dealing with tourism in general or in peak seasons?
4. In your role as an Officer of Public Affairs, how much direct contact or face-to-face interaction do you have with visitors?
5. What types of positive and negative impacts of tourism do you see most in the parks? (ex. Trampling vegetation, feeding wildlife, etc.) Which occurs most often?
6. What forms of advertising are done and which types are most influential on tourism? How has advertising changed over time?
7. What forms of social media are used by you or visitors, and which types are most influential on tourism? How has the use of social media changed over time?
8. What are the NPS's current and/or future goals for their own social media?
9. Are NPS social media outreaches coordinated at the park, regional, or national level?
10. How effective has social media been in communicating with various demographics of the public?
11. What are some things people could do to be more responsible tourists in these sensitive places?
12. Can you think of any ways that social media could be leveraged to reduce the impacts of tourism, educate them, or make them better visitors?

