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INTERPRETATION AND IMPLEMENTATION  
OF DIRECTOR'S ORDER #41, SECTION 7.2:  
DETERMINING BEST MANAGEMENT  
PRACTICES FOR WILDERNESS CLIMBING  
IN THE NATIONAL PARKS

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INTERPRETATION AND IMPLEMENTATION OF DIRECTOR'S ORDER #41,  
SECTION 7.2: DETERMINING BEST MANAGEMENT PRACTICES FOR  
WILDERNESS CLIMBING IN THE NATIONAL PARKS

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WILDERNESS CLIMBING IN THE NATIONAL PARKS

Chairperson: Dane Scott

Climbing in national parks' wilderness areas has long created tension for managers between providing recreational opportunities and maintaining wilderness values. This activity presents a challenge to wilderness management as managers try to balance feelings of solitude in wilderness and opportunities for unconfined recreation. Increased interest in climbing in the national parks lead to management considerations to satisfy Director's Order #41: Wilderness Stewardship (DO41). In October 2013, the National Park Service (NPS) issued Director's Order #41, Section 7.2, Climbing (DO41, Sec. 7.2), to clarify management of climbing in wilderness. Climbing in designated wilderness requires management due to conflicts between this growing recreational activity and maintenance of the qualities of wilderness character. With the publication of DO41, Sec. 7.2, the NPS has specific mandates for how to manage wilderness climbing. While the Order does provide a directive for the agency, it intentionally leaves room for interpretation to allow the parks to manage according to the specific needs of their park. The objectives of the study were to (1) ascertain what management actions have been implemented by national parks in response to DO41, Sec. 7.2; (2) determine how effective managers judge these actions to be; and (3) collect manager suggestions for improving the implementation of DO41, Sec. 7.2 in the national parks. Collecting online information on climbing in wilderness and conducting telephone interviews with managers experienced with climbing from a sample of national parks where climbing in wilderness is present fulfilled these objectives. The findings articulated that there should be more consistency in presentation of information to the climbing community. Lastly, relationships between the climbing community and National Park Service personnel are essential to effective management of climbing activity.

Table of Contents

**SECTION 1. INTRODUCTION..... 1**

1.1 What is a Director’s Order? ..... 2

1.2 Director’s Order #41: Wilderness Stewardship ..... 3

1.3 Significance to the Field..... 4

**SECTION 2. LITERATURE REVIEW ..... 6**

2.1 The Wilderness Act of 1964..... 6

2.2 Wilderness Character ..... 7

2.3 History and Management of Climbing in the National Parks ..... 8

2.4 Place-based Management in the National Parks ..... 11

2.5 Climbing Regulation in the National Park Service ..... 12

**SECTION 3: SUMMARY OF RESEARCH METHODS..... 15**

3.1 Research Methods Summary..... 15

3.1.1 Description of Methods and Analyses for Collection of Online Information . 15

3.1.2 Description of Methods and Analyses for Qualitative Interviews..... 16

3.1.3 Significance of the Research Approach..... 20

3.2 Descriptions of Director’s Order #41, Section 7.2 Elements..... 21

**SECTION 4: FINDINGS..... 23**

4.1 Online User Group Information Findings ..... 23

4.2 Guiding Management Documents Findings..... 27

4.3 Qualitative Findings of Interviews with Park Personnel..... 34

4.3.1 The Effectiveness of Face-to-face Communication..... 34

4.3.2 Historical Relationships Between Managers and Users and the Concept of Trust ..... 37

4.3.3 Need for Scientific Research ..... 41

4.3.4 Climbing Remains a Low-Priority Recreational Activity ..... 43

4.3.5 Fixed-Anchor Management ..... 45

4.4 The Emerging Benefits of Social Media Use..... 46

**SECTION 5. DISCUSSION ..... 47**

5.1 Director’s Order #41, Section 7.2 Implementation ..... 48

5.2 Best Practices for National Park Service Wilderness Climbing Management..... 49

5.2.1 Good Relationships Yield Great Benefits to the NPS and Climbing Community ..... 50

5.2.2 Filling Knowledge Gaps by Gathering Baseline Data and Centralized Databases .....	52
5.2.3 Providing a Suite of Information Avenues and Improving Access .....	53
5.3 Research Limitations .....	53
5.4 Areas for Future Research Studies .....	54
<b>SECTION 6. CONCLUSION .....</b>	<b>55</b>
<b>REFERENCES.....</b>	<b>57</b>
<b>APPENDIX A .....</b>	<b>61</b>
<b>APPENDIX B .....</b>	<b>62</b>
<b>APPENDIX C .....</b>	<b>65</b>
<b>APPENDIX D .....</b>	<b>67</b>
<b>APPENDIX E: RESEARCH METHODS .....</b>	<b>75</b>
<b>APPENDIX F .....</b>	<b>80</b>

## SECTION 1. INTRODUCTION

Where humanity once feared the wilderness as foreign and unknown to humankind, the United States now treats it with pride and reverence (Nash, 1967). We can trace this history back to the 1920s, when social movements encouraged the protection of these vast, wild lands (ibid.). Wishes to protect these unspoiled lands throughout the United States led to the introduction of legal public protection culminating in the introduction of the Wilderness Act of 1964 (Act). Throughout the United States, federal and state agencies maintain wilderness areas in accordance with the Act. The Act defines wilderness as

An area of undeveloped Federal land retaining its primeval character and influence, without permanent improvement or human habitation...an area where the earth and its community of life are untrammelled by man...generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable...has outstanding opportunities for solitude or a primitive and unconfined types of recreation...lands designated for preservation and protection in their natural condition. (1964, Sec. 2(c))

Although the definition articulates what constitutes wilderness, it is often difficult to manage for all attributes of wilderness simultaneously.

Wilderness managers are often faced with a balancing act when it comes to recreation. For example, climbing in national park wilderness is an accepted recreational activity, but in recent years it has been the focus of debate. Preserving wilderness character lies at the center of these debates. Under the Act, Section 2(c), wilderness character is “natural, provides for *solitude* and *primitive and unconfined types of recreation*, undeveloped and containing no permanent improvements, untrammelled”, and “may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value” (Wilderness Act, 1964). While some management decisions

lend themselves easily to the definition of wilderness character, climbing in wilderness requires managers to address a variety of questions. For example, are they managing for solitude or unconfined recreation opportunities? To make these sometimes-difficult decisions, managers reference a variety of guiding documents.

Of these documents, Director's Order #41: Wilderness Stewardship (DO41) and its accompanying Reference Manual #41 (RM-41) provide directions for park personnel to determine best practices for wilderness stewardship in the national parks. Section 7.2 of DO41 is pertinent to this research because it outlines how climbing should proceed in NPS wilderness areas. This section of DO41 aims to provide guidance to park personnel for climbing in wilderness while also providing a degree of latitude to accommodate park-specific needs and objectives. Place-based management for climbing is needed due to historical and geographic differences between different national parks. The park-specific management documents provide guidance incorporating these characteristics. Management documents provide direction to national park personnel for decision-making, but intentionally use vague language to accommodate park-specific needs.

### 1.1 What is a Director's Order?

A director's order is a type of policy-implementing document written in compliance with the NPS' Management Policies, published in 2006. This document outlines the role of the NPS mandate to “[develop] policy to interpret the ambiguities of the law and to fill in the details left unaddressed by Congress in the statutes” (UDI & NPS, 2006). These policies state that the NPS strives to maintain consistency within the different park units and with other federal and state agencies. The intent of this consistency is to “encourage, sponsor, and participate in intra-agency and interagency

training and workshops designed to promote the sharing of ideas, concerns, and techniques related to wilderness management” (USDI & NPS, 2006). The NPS is committed to producing a universal vision, not strict rules for the national parks to follow when implementing policy. This approach allows national parks to apply policy to management in accordance with park objectives.

## 1.2 Director’s Order #41: Wilderness Stewardship

Director’s Order #41: Wilderness Stewardship (DO41) was discussed for many years and published in 2013. As an effort to provide some guidance to wilderness recreation managers, climbing management was included in Section 7.2 of DO41. Due to a lack of agreement on what should specifically be provided within DO41 on climbing management, the language is intentionally vague. The document takes a more open-ended approach to climbing management, and it is viewed as a start to providing guidance for wilderness stewardship and management of climbing.

Director’s Order #41, Section 7.2 (DO41, Sec. 7.2) was chosen as the focus of this study because it is the first director’s order that specifically addresses the management of climbing in NPS wilderness areas. Since the document was issued in 2013, sufficient time has passed to research its implementation. This research should be of interest to wilderness managers since it identifies best practices and areas for improvement in the implementation of DO41, 7.2, which specifically articulates management of climbing in wilderness. This document recognizes the common issues that climbing in wilderness present to managers and attempts to clarify a universal vision for climbing’s presence in NPS designated wilderness areas.

The goal of DO41, Sec. 7.2 is to act as a starting point for more specific management while acknowledging the site-specific needs of parks and the benefits of indefinite language. While ambiguity is beneficial for park-specific needs, sometimes disagreement on certain terms and authorization protocols leads to a variety of approaches to management. This may cause confusion when climbers move from park to park. Additionally, this vague language may lead to uncertainty when making management decisions. Thus, a goal of this project is to provide a snapshot of what is occurring in the different national parks to provide to national park personnel. This report strives to provide information on how and to what extent national park documents are implementing DO41, Sec. 7.2.

### 1.3 Significance to the Field

In recent decades, climbing has grown rapidly in popularity. The Access Fund notes that, “more than 1,400 indoor climbing gyms exist in North America, serving an estimated 4,300 new climbers each day.” Additionally, a 2013 report issued by the Outdoor Foundation reported that 27 percent of outdoor climbers were new to the sport (Outdoor Participation Report 2013). Predictably, a significant portion of those indoor climbers eventually participate in outdoor climbing as well. An article written in 2014 stated that a recent study found that “70 percent of new gym climbers say they aspire to someday climb outdoors” (Noble). The 2015 *Outdoor Recreation Participation Topline Report* noted that, as of 2014, climbing alone experienced a sixteen-percent increase over three years. The NPS predicts that this increase in the sport’s popularity will lead to an increase in climbing activities (USDI & NPS, RM-41, 2013). Additionally, some of this increased climbing activity will likely occur in NPS-designated wilderness areas. This

growth in climbing activities will have impacts on climbing management in wilderness areas within the NPS.

One significant goal of DO41 is to allow managers to share the wealth of knowledge and effective practices throughout the NPS. This research project provides information on how DO41, Sec. 7.2 is being interpreted and implemented throughout parks with climbing to be shared throughout the agency. In particular, this research identifies and investigates five elements of DO41, Sec. 7. 2.. The five elements are: wilderness climbing education, climbing impact monitoring, fixed anchor management practices, fixed anchor approval/authorization process, and incorporation of Leave No Trace (LNT) education. These five elements focused the three objectives of this investigation: (1) the analyses of user group information, (2) the content analysis of management documents, and (3) the qualitative interviews of NP managers. This research focused on addressing how some national parks are incorporating DO41, Sec. 7.2's elements into their education materials, management documents, and management practices. I collected and shared my data with the NPS and other interested parties to share knowledge, and therefore helped accomplish an essential aspect of DO41.

This study answers the following research questions:

1. In response to Director's Order #41, Section 7.2 (DO41, Sec. 7.2), what management actions have park units implemented regarding wilderness climbing?

- 1a. How is DO41, Sec. 7.2 incorporated into online user group information?

- 1b. How is DO41, Sec. 7.2 incorporated into management documents?
2. Which management actions from Director's Order #41, Section 7.2 are identified as best practices?
3. What concerns do managers have with wilderness climbing and Director's Order #41, Section 7.2 implementation?

## SECTION 2. LITERATURE REVIEW

### 2.1 The Wilderness Act of 1964

Although wilderness and the national parks were initially thought of as synonymous, national parks were created with highly anthropocentric motives to increase the ease of visitation to these national treasures whereas wilderness was defined by an absence of modification of the natural landscape (Miles, 2009). The Wilderness Act was written into congressional policy in 1964 and it symbolized an increasing desire to preserve public lands not only for recreation and enjoyment, but also for preservation itself. In Section 2(c) of the Act, wilderness is defined with the following description:

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions. (Wilderness Act, 1964, Sec. 2(c))

This definition of wilderness describes an ideal, pristine space whereas the remainder of the section provides characteristics of wilderness to broaden the definition and include

human activity. There are qualifying terms incorporated into this part of the definition including “generally”, “primary”, and “substantially” (Coggins, et al., 2014). These qualifying terms depart from the ideal definition provided above. These qualified characteristics of wilderness include:

(1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. (Wilderness Act, 1964, Sec. (2(c))

The four characteristics that define a wilderness are written to allow agencies some room to interpret the Act to suit their specific wilderness areas and agency missions.

## 2.2 Wilderness Character

Management of wilderness areas requires the Act to set some standards for what should be maintained in wilderness. Therefore, Section 4(b) of the Act requires that

each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this chapter, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use. (Wilderness Act, 1964, Sec. 4(b))

While the NPS is mandated to provide opportunities for unconfined recreation, it is equally mandated to preserve wilderness character. Wilderness character is explicitly defined as a holistic concept based on the interaction of (1) biophysical environments primarily free from modern human manipulation and impact, (2) personal experiences in natural environments relatively free from the encumbrances and signs of modern society, and (3) symbolic meanings of humility, restraint, and interdependence that inspire human

connection with nature. Taken together, these tangible and intangible values define wilderness character and distinguish wilderness from all other lands (Landres, et al., 2015).

Monitoring for wilderness character is performed by separate NPS park units; separate units are therefore not compared to each other when monitoring wilderness character. Landres, et al. (2015) state that “trend[s] in wilderness character can be based only on how wilderness character is changing within an individual wilderness, and wilderness character cannot be compared between wildernesses because such comparisons are meaningless” (p. 13). It is possible that improving one quality of wilderness character may result in degradation of another (Landres, et al., 2015). For example, the opportunity for primitive and unconfined recreation can be expanded when climbers place a bolt for safety, but this metal object may also degrade the natural quality of the landscape. In some instances of recreation, managers are faced with the challenge of which aspect of wilderness character to preserve. These challenging decisions are made with both the historical and geographical aspects of the park in mind in keeping with the NPS’ place-based management approach. This is due to each national park’s distinct foundation statements. Decisions regarding management of NPS wilderness areas, related to climbing or other recreational activities, reference the foundation statement of the park, the Wilderness Act, and other relevant management documents.

### 2.3 History and Management of Climbing in the National Parks

Congress issued the Act in 1964 to clarify what constitutes wilderness as well as what may or may not be allowed on wilderness lands. In relation to climbing, the Act allows for wilderness-dependent recreation while restricting non-wilderness-dependent

recreation in wilderness. Preisenderfer (2008) observes that climbing, in many cases, relies on places that are located in NPS wilderness. For example, many mountaineering routes on Mt. Denali and Mt. Rainier are in wilderness, as are the iconic rock climbs on Yosemite's El Capitan and Half Dome and the popular climbing routes in Zion National Park. Hence, climbing, in many cases, is dependent on a wilderness backdrop.

The increase of climbers in wilderness areas requires management actions to preserve wilderness characteristics. It is important to note that there are a variety of recreational opportunities that create similar tensions for managers trying to balance recreation with wilderness character: climbing is simply one recreational activity among many. Further, most of the impacts of climbing on wilderness character are not unique to this activity: impacts on solitude, plant life, wildlife, and concerns over litter, soil erosion, and others. With recreation rising in popularity within national parks wilderness, solitude is threatened. The national parks have seen an immense increase in recreational visitation in recent years; the National Parks Conservation Association stated that, "national parks saw their highest visitation ever in 2015, with more than 307 million recreational visits. This marks a nearly 5% increase from 2014" (Errick, 2016). Increased visitation to the national parks will inevitably lead to more recreational visits to the wilderness areas within the national parks.

Other issues associated with recreation relate to ecological impacts. We can attribute some explicitly to climbing, but often other activities that include larger groups of people – group hikes, camping in larger groups, etc. – can have large impacts on vegetation and wildlife in wilderness. Additional impacts that may result from recreation in wilderness include: litter, human waste, deterioration of developed trails, development

of undesired trails, proliferation of campsites, visitor conflict, too many encounters with people, harassment of wildlife, and contamination of water resources (Attarian & Keith, 2008).

Climbing shares many of these potential impact concerns as climbers approach cliffs and often camp near the base of cliffs. For climbing, issues associated with ecological impacts are often focused on the areas of approaching, descending, and camping (Cole, 1989; Marion & Carr, 2007). Climbing often impacts vegetation at the base, summit, and face of the climb (Kuntz & Larson, 2006; Marion & Carr, 2007; Rusterholz, 2004). In addition to ecological impacts, climbing activity may impact wildlife; these impacts often affect raptors and other wildlife on the cliff face (Gander & Ingold, 1997; Camp & Knight, 1998, Rossi & Knight, 2006).

One impact that is unique to climbing and caving is the use of fixed anchors. According to the definition presented in the Act, types of climbing that require the placement of fixed anchors and/or other equipment are in potential conflict with acceptable wilderness behavior. The placement of fixed anchors in wilderness areas has been controversial. Ultimately, DO41, Sec. 7.2 attempted to settle the controversy in 2013 and allowed fixed anchors in NPS wilderness under certain conditions. The order allows them if they are “rare” and their placement does not result in “bolt-intensive face climbs.” These terms are currently being discussed by the Wilderness Climbing Management Network, which is composed of all levels of NPS personnel. This network is writing a white paper on these terms to provide more direction on fixed anchor placement for managers to reference. While some have argued that fixed anchors violate the Wilderness Act, they are at times needed for safety reasons and the NPS has decided

to allow fixed anchors in wilderness areas (Keith, 2013; NPS Reference Manual #41; Watson, et al., 2000).

## 2.4 Place-based Management in the National Parks

Director's Order #41: Wilderness Stewardship is an example of an agency-wide policy document that mandates implementation by all national parks. However, there are opportunities for unit-based discretion on the implementation of some policies. This recognizes site-specific needs of individual parks. For example, in relation to climbing and fixed anchors, Section 7.2 of DO41, states, "If unacceptable impacts are occurring in wilderness as a result of climbing, the park superintendent may deem it necessary to restrict or prohibit the placement of fixed anchors" (2013, p. 16). Park-specific management is therefore important to consider when analyzing policy implementation, such as DO41, Sec. 7.2 implementation.

Given significant historical and geographical differences among parks, as discussed earlier, some unit-based discretion in implementing policies is the most effective way to fulfill the original mission set by Congress in 1916. The foundational documents of the NPS, including the Organic Act, established an inherent tension between recreation and preservation in the NPS's mission. Today, this tension is largely due to increased visitation in the national parks that conflicts with the wilderness value of solitude. In terms of climbing, this tension varies from park to park. For example, due to its history and geology, Yosemite NP attracts thousands of climbers each year, whereas other parks see far fewer. The tension creates a need for constant re-evaluation of the park's actions by the park administrators. Additionally, the congressional documents that

founded individual national parks prioritize different values; this makes rigid applications of agency-wide policy impractical (National Park Service Organic Act of 1916).

Preisenderfer (2008) states that “Blanket policy applied to such variation has the potential to place unnecessary confines on an appropriate type of wilderness recreation and alienate a user group that has long supported wilderness” (p. 21). Multiple studies have shown that the preservation of wilderness climbing requires place-based management and unit-based discretion (Murdock, 2010; Preisenderfer, 2008). This is relevant to the research as a one-size-fits-all approach to management agency-wide is impractical and undesirable. Identifying the various possible ways to implement DO41, Sec. 7.2 is paramount to this research and answering how parks are implementing it regarding their different missions.

## 2.5 Climbing Regulation in the National Park Service

The mission of the NPS states that “The National Park Service preserves unimpaired the natural and cultural resources and values ... for the enjoyment, education, and inspiration of this and future generations.” Additionally, it states that “The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world” ([www.nps.gov](http://www.nps.gov)). In order to clarify the definition of “wilderness stewardship,” the NPS published DO41 to “provide accountability, consistency, and continuity in the National Park Service (NPS) wilderness stewardship program, and to guide service-wide efforts in meeting the requirements of the Wilderness Act (16 U.S.C. 1131-1136)... and [establish] specific instructions and requirements” (2013, p. 1). Additionally, the document states that “This Order should be applied to wilderness stewardship actions carried out within

the framework of park general management plans, wilderness stewardship plans, natural resource plans, cultural resource plans, fire management plans, and other activity-level plans” (USDI & NPS, 2013, p. 1). Director’s Order #41 is designed to “provide accountability, consistency, and continuity in the National Park Service (NPS) wilderness stewardship program” (USDI & NPS, 2013, p. 1). This overarching Order is the most focused document when dealing with management decisions and issues in the NPS’ federally-designated wilderness as it is written specifically for the NPS.

This national policy includes regulations for climbing on NPS wilderness areas. Director’s Order #41, Section 7.2 clearly defines climbing as “climbing, snow and ice climbing, mountaineering, canyoneering, and caving, where climbing equipment, such as ropes and fixed or removable anchors, is generally used to support ascent or descent” (USDI & NPS, 2013, p. 15). Director’s Order #41, Section 7.2, Climbing, articulates the aspects of climbing management that managers need to focus on. Section 7.2 of the Order is included in Appendix C, but specific management aspects of the section are outlined below:

1. Inclusion in national park’s Wilderness Stewardship Plan or activity-level plan (i.e. climbing management plan (CMP)) if climbing in wilderness exists
2. Exchange of information on best practices with other national parks that offer wilderness climbing
3. Providing information to the public on what management exists for wilderness climbing within the national park
4. Impact monitoring where climbing occurs

5. Placement of permanent protection is acceptable under very certain circumstances outlined by the park
  - Placement must not impair the future enjoyment of wilderness or violate the Wilderness Act
  - Placement must be performed without motorized tools
6. Bolt-intensive climbs are prohibited as these types of climbing locations attract large crowds and higher impact to the rock face and therefore do not comply with wilderness preservation and management
7. The process for authorization is the responsibility of each specific park unit where climbing is present in wilderness. This authorization process may be issued within the Wilderness Stewardship Plan or through an activity-level plan, and additionally may be provided through a permit system within the park
8. “Clean climbing” techniques – in particular, Leave No Trace (LNT) – should be standard in wilderness. Climbers should be required to utilize mainly temporary equipment that does not alter the environment (i.e. slings, cams, nuts, chocks, and stoppers)
  - Practices that alter the rock or vegetation (i.e. gluing or chipping holds and removing vegetation) are prohibited by NPS regulations.

Of the eight aspects of DO41, Sec. 7.2, I identified five elements relevant to the analyses of online user group information, management documents, and qualitative interviews. These elements are numbers 3, 4, 5, 7, and 8 in the bulleted list above. The

other aspects of DO41, Sec. 7.2 are central tenets of DO41, Sec. 7.2, but are strict guidelines that cannot be analyzed, but are rather inferred by all national park units.

## SECTION 3: SUMMARY OF RESEARCH METHODS

To gain an understanding and documentation of how DO41, Sec. 7.2 is being implemented in national park wilderness areas, I analyzed online information and management documents. This aspect of the research allowed me to collect a snapshot of information and provide context for the interview guide. I developed the interview guide to provide more information on how national parks implement DO41, Sec. 7.2 and guide the qualitative interviews. The qualitative interviews provided contextual information on what managers deem best practices for wilderness climbing in the NPS and how to make DO41, Sec. 7.2 more effective. Below is a summary of the research methods I utilized for this project.

### 3.1 Research Methods Summary

To assess the implementation of the eight aspects of the order (Section 2.5 above), and to identify best practices and areas of concern, I collected online information, performed a content analysis of management documents, and conducted qualitative telephone interviews.

#### 3.1.1 Description of Methods and Analyses for Collection of Online Information

Online information was gathered by searching for relevant information on the individual NPS websites as well as analyzing relevant documents (including general management plans, activity-level management plans (i.e. climbing management plans)

when possible, and superintendent compendiums). For more information on the two part analysis of user group information and management documents, refer to Appendix E.

### 3.1.2 Description of Methods and Analyses for Qualitative Interviews

A vital aspect of collecting information for this research was analyzing DO41 and specifically DO41, Sec. 7.2. Specifically, information collected from DO41, Sec. 7.2 helped inform the development of the interview guide. This vital aspect of the project not only informs the interview guide, but also allowed me to have detailed knowledge of what the national parks have published so that conversation remained relevant to the specific park. This allowed for probing the interviewee as well as being able to coherently follow comments from the interviewee. These qualitative interviews were conducted to further answer how DO41, Sec. 7.2 is being implemented as well as which management actions wilderness managers identify as best practices. In addition to helping answer the first two research questions, the interview questions were also designed to address how wilderness managers think management could be made more effective.

There are 765 wilderness areas, totaling 109,138,248 acres, in the United States. Of the land in the United States, the NPS manages thirteen-percent of federal lands and forty-percent of the acreage within NWPS. This results in the NPS utilizing fifty administrative offices to manage sixty-one wilderness areas (wilderness.net). Of these wilderness areas, there are approximately thirty-seven areas where climbing is documented, or conditions exist where it could occur (wilderness.net; mountainproject.com; summitpost.com; rockclimbing.com). Although thirty-seven NPS wilderness areas have potential climbing present, the NPS recognizes fifteen locations

where wilderness and climbing coincide (<https://www.nps.gov/findapark/advanced-search.htm?a=32&p=1&v=0>). This distinction is made based on NPS websites which include both climbing (including climbing and mountaineering) and wilderness on their website. This information was found by using the “Advanced Search Tool” (<https://www.nps.gov/findapark/advanced-search.htm?a=32&p=1&v=0>) which can be used to filter national parks by state, activity, and topic (wilderness is included under the topic filter). All thirty-seven areas were initially included in the search and assessed for whether climbing and wilderness were included on their websites. After this initial search, only fifteen of the national parks included climbing and wilderness on their NPS website. Upon contacting the fifteen national parks, Glacier Bay National Park and Preserve was excluded due to lack of climbing activity in the area emphasized by the national park employees. The other fourteen locations were the focus of the online information data analysis and qualitative interviews for this study due to their public information on climbing in wilderness being available to the public and therefore more easily assessed on how its implementation is functioning (refer to Appendix A, Table 5 for a list of NPS wilderness areas included in the study).

The population for this research included all national parks with designated wilderness where climbing occurs. It is possible that some national parks were not identified in the sampling process and therefore not included in the sample of interview. To gather information on the park units’ management, the sample utilized for the telephone interviews included at least one interview from each national park unit in the park where the NPS indicates that both climbing, and wilderness exist. Cross referencing on websites, such as [mountainproject.com](http://mountainproject.com) and [summitpost.com](http://summitpost.com), determined that these

national parks had known climbing areas in wilderness, thus validating the sample for the study.

The participants involved in the study included both female and male participants who serve in some capacity in wilderness climbing management in the NPS. The study included at least one interview from fourteen national parks throughout the United States where climbing and wilderness coincide. The sampling techniques utilized for this study included both purposeful and snowball sampling. The purposeful sampling included contacting the wilderness coordinator of the national park to identify the proper individual to contact. Snowball sampling occurred when it was more difficult to locate the proper individual by contacting the wilderness coordinator. When snowball sampling was required, individuals from the NPS, Leave No Trace Center for Outdoor Ethics, and the Access Fund were contacted to “[identify] ... participants who fit the study’s criteria and then [asked] these people to suggest a colleague [or] a friend” (Tracy, 2013, p. 136). Participants were emailed asking them to partake in the study and no incentive was given. The enrollment email provided enough information to the participants to allow them to understand the purpose of the study. Additionally, the interview guide was attached to the email to allow the NPS personnel to prepare for the interview. Important to note is that the researcher is a climber and able to relate to the participants and understand the climbing jargon utilized. Climbing is a subculture in recreation and association with the sport includes understanding this jargon.

I acted as an external tool to gather information through interviews. Interviews were almost entirely administered on the telephone due to not being able to travel to the various national parks to meet with the NPS employees. One interview was administered

in person due to proximity of the employee. Institutional Review Board (IRB) approval was not required for the project due it being deemed non-human research. Interviews were recorded, with consent, and then later transcribed with the use of Rev.com. In addition, interview notes were taken and used during analysis of the interviews. Tracy (2013) writes that “qualitative interviews provide opportunities for mutual discovery, understanding, reflection, and explanation via a path that is organic, adaptive, and oftentimes energizing” (p. 132). The purpose of this research was to allow for introspective data to be gathered and then analyzed by the research to extrapolate information from unstructured interview data.

The analysis of the qualitative interviews began with automated transcription of the interviews which ranged from twelve to thirty-six minutes in length. To allow for multiple analyses throughout the data analysis, constant comparison was utilized. The data was constantly compared to allow for categories to arise from the interview data. The constant comparative method is a “method of analysis used to compare data applicable to each code and to modify code definitions so as to fit new data” (Tracy, 2013, p. 202). This method of data analysis allowed for categories to be created and modified throughout the process. The constant comparative method “is concerned with generating and plausibly suggesting (but not provisionally testing) many categories, properties, and hypotheses about general problems.... [and] unlike analytic induction [other] properties are conditions, consequences, dimensions, types, processes, etc.” (Glaser & Strauss, 1999, p. 104). The constant comparative method does not “attempt...to ascertain either the universality or the proof of suggested causes or other properties” (Glaser & Strauss, 1999, p. 104). The use of the constant comparative method

in data analysis allowed for more multiple categories to be identified and modified throughout the process.

### 3.1.3 Significance of the Research Approach

The collection of data and analyses fulfilled the objectives outlined for the project: (1) determining what management actions national parks have implemented response to DO41, Sec. 7.2; (2) determining how effective managers judge these actions to be; and (3) collecting manager suggestions for improving the implementation of DO41, Sec. 7.2 in the national parks. Objectives 2 and 3 satisfy the goal of providing information to managers on best practices. I identified these best practices from themes that emerged in the qualitative interviews and I have provided them as recommendations in the discussion section of this report.

Five years after DO41, Sec. 7.2, this research identified to what degree parks incorporate DO41, Sec. 7.2 into wilderness climbing education and climbing management documents. To accomplish these goals, this research focused on two aspects, including a two-faceted analysis of information accessed online and qualitative interviews.

This research identified how parks incorporate DO41, Sec. 7.2 and its five elements into various aspects of wilderness climbing education and management. The first analysis identified what online education is available to the public by a review of NPS park unit websites, analyzing both the content and accessibility of information. The second analysis identified how parks incorporate DO41, Sec. 7.2 into management documents by reviewing four types of management documents (including *Superintendent's Compendiums*, General Management Plans, Wilderness/Backcountry

Management Plans/Wilderness Stewardship Plans, and Climbing Management Plans) that provide guidance to managers.

From the qualitative interviews, I made inferences on best management practices, concerns that managers have regarding wilderness climbing, and ideas on making management more effective. Of the fourteen national parks chosen as part of the study, I included thirteen in the interviewing process. Olympic NP chose not to participate. I conducted interviews with one park employee for eleven of the national parks in the sample and two individuals at Joshua Tree NP and Yosemite NP. I selected voluntary participants through purposeful and snowball sampling for fifteen interviews including both male and female interviewees. I then transcribed the interviews and used a constant comparative approach to analyze them.

Analyses of online sources, management documents, and qualitative interviews yielded information on how a sample of national parks implement five main elements of DO41, Sec. 7.2: wilderness education, monitoring impacts, information on fixed anchor placement regulations, fixed anchor approval process (if this exists), and LNT information.

### 3.2 Descriptions of Director's Order #41, Section 7.2 Elements

Descriptions of the five elements of DO41, Sec. 7.2 are provided below. The five elements and explanations of each are explained as they are presented in DO41, Sec. 7.2.

- ❖ **Wilderness Education (WE):** Wilderness education, for the purposes of this research, included any wilderness information pertaining to climbing. This aspect of DO41, Sec. 7.2 states: “Wilderness climbing education ... will be [an] important [component] in climbing management programs” (p. 15). I located and

compiled information from online resources on various types of wilderness education. This aspect of wilderness climbing management under DO41, Sec. 7.2 is in direct relation to monitoring impacts. Refer to Table 6 in Appendix D for park-specific wilderness climbing education and management.

❖ **Monitoring Impacts (MI):** Monitoring impacts from climbing in NPS wilderness is another major tenet of DO41, Sec. 7.2: “Impact monitoring will be [an] important component in climbing management programs” (USDI & NPS, 2013, p. 15). Any information that corresponded to monitoring impacts from climbing were analyzed. Refer to Table 7 in Appendix D for park-specific monitoring protocols.

❖ **Fixed-Anchors Placement/Removal (FA):** Fixed-anchors placement and removal processes are a major aspect of DO41, Sec. 7.2. It states that “It is recognized that the use of removable anchors may reduce, but does not in every case completely eliminate, the need for fixed anchors. The occasional placement of a fixed anchor for belay, rappel, or protection purposes does not necessarily impair the future enjoyment of wilderness or violate the Wilderness Act” (p. 15). Refer to Table 8 in Appendix D for park-specific fixed anchor placement and removal education and policy for wilderness areas.

❖ **Fixed Anchor Approval Process (FAAP):** The process for approving fixed anchors is another important part of DO41, Sec. 7.2. It states that:

Fixed anchors or fixed equipment should be rare in wilderness. Authorization will be required for the placement of new fixed anchors or fixed equipment. Authorization may be required for the replacement or removal of existing fixed anchors or fixed equipment. The authorization

process to be followed will be established at the park level and will be based on a consideration of resource issues (including the wilderness resource) and recreation opportunities. Authorization may be issued programmatically within the Wilderness Stewardship Plan or other activity-level plan, or specifically on a case-by-case basis, such as through a permit system. (DO41, p. 15)

Information was collected on whether a process existed, and if so, what this process looked like. Refer to Table 9 in Appendix D for park-specific fixed anchor approval/authorization policies.

- ❖ **Leave No Trace Education/ “Clean Climbing” (LNTE):** Providing LNT and “clean climbing” education to climbers is another of DO41, Sec. 7.2’s main tenets. This aspect of the order is emphasized with the following statement:

‘Clean climbing’ techniques should be the norm in wilderness. This involves the use of temporary equipment and anchors that can be placed and removed without altering the environment (e.g. slings, cams, nuts, chocks, and stoppers). Practices such as gluing or chipping holds, and damaging or removing vegetation on or at the base of climbing routes, are prohibited by NPS regulations (36 CFR 2.1). The use of motorized equipment (e.g. power drills) is prohibited by the Wilderness Act and NPS regulations (36 CFR 2.12). Climbers are encouraged to adopt Leave No Trace principles and practices for all climbing activities, including packing out all trash and human waste. (DO41, p. 16)

Refer to Table 10 in Appendix D for park-specific wilderness LNT and “clean climbing” education and management policy

## SECTION 4: FINDINGS

### 4.1 Online User Group Information Findings

The analysis of user group information showed that NPS websites often include information from DO41, Sec. 7.2. Often, this information was available on the national park’s main site, under the section “Things to Do” and the subsection “Climbing.” The

quantity and content of information varied: while some parks provided extensive user group information on their websites, others had little to none.

National Park	DO41, Sec. 7.2 Implementation		
	WE	FA	LNTE
<b>Black Canyon of the Gunnison</b>	×		×
<b>Denali</b>	×		×
<b>Gates of the Arctic</b>			×
<b>Joshua Tree</b>	×		×
<b>Kings Canyon/Sequoia</b>	×		×
<b>Mount Rainier</b>	×		×
<b>North Cascades</b>	×	×	
<b>Olympic</b>	×		
<b>Pinnacles</b>	×	×	
<b>Rocky Mountain</b>	×		×
<b>Shenandoah</b>	×	×	×
<b>Wrangell-St. Elias</b>	×		
<b>Yosemite</b>	×	×	×
<b>Zion</b>	×		×

**Table 1** Director's Order #41, Section 7.2 implementation within online user group information. A tick mark indicates that the information is presented within the document and lack of a tick mark indicates that no information was located.

Table 1 provides information on the elements of DO41, Sec. 7.2 that specific national parks incorporate into user group information. While many NPS websites include wilderness education and LNT education, information on fixed anchor placement is only included for four of the national parks in the sample. The fixed anchor

controversy within the NPS wilderness was settled by DO41, Sec. 7.2, which allows fixed anchor placement and provides general guidelines, but does not clarify any distinct universal regulations for how or where they should be placed, making the lack of online information concerning. It may lead climbers to place fixed anchors and protection improperly if they rely on online resources for this information, especially if they go to a national park in the off season and there are fewer personnel to provide information in person.

Confusion may also result from limited user group information for fixed anchor placement/removal as different parks vary in their rules and regulations. For example, Zion NP requires that fixed anchors be painted to match the environment while Yosemite NP has no such regulation (USDI & NPS, 2007). This dissonance in policy between the two parks may result in climbers assuming that the policy from Yosemite NP is the same in Zion NP, especially since Zion does not include any of this information on its website. Hence, climbers may unknowingly be placing fixed anchors improperly. In terms of possible best practices, it seems that park units should review their websites for wilderness climbing and ensure that DO41, Sec. 7.2 elements are addressed to improve this type of communication with individuals who rely heavily on the internet for planning. Additionally, parks may also use social media to increase their interface with the public and share a consistent and accurate message to climbers.

User experiences with park websites on other topics (LNT, wilderness education, etc.) is also notable. There were a few very accessible websites that provided all the information that a climber going to the park should know. Yosemite NP and Zion NP's websites were exemplary: it provided information on all the elements from DO41, Sec.

7.2 and links to other webpages for visitors to be fully informed before entering the park. National parks looking to improve their websites could reference these examples.

Other websites gave me serious difficulties accessing information, particularly Wrangell-St. Elias NP, which is especially problematic as it provides few places to communicate in person with park personnel. While online guidance cannot replace face-to-face communication, ensuring that there is sufficient information online to guide climbers who rely on the internet may ease management challenges in the future.

While the NPS should preferably update its website regularly with wilderness climbing information some national parks utilize local climbing organizations and their websites to provide material to the public. Relationships between the national parks and climbing communities are essential to successfully managing the wilderness climbing community and resources. For example, Pinnacles NP had very little material on its website on wilderness climbing but linked directly to the Friends of the Pinnacles website on their climbing page. Friends of Pinnacles is a local climbing organization (see Appendix F) that works directly with the NPS to maintain wilderness climbing in the park. This organization keeps their website updated with information on climbing in the park and closures and provides contact information if climbers have any questions. This type of relationship is very effective and takes some of the burden of education off the national park. Making these relationships explicit like Pinnacles NP has done by including a link to the partner's website is a simple, cost-effective, invaluable way to utilize effective relationships with local climbing organizations to provide information to the public.

## 4.2 Guiding Management Documents Findings

The NPS can utilize a variety of guiding documents for management and enforcement. A national park unit can change or create park policy in one of two ways: through an amendment to its annual *Superintendent's Compendium*, or through a new management plan.

❖ **Superintendent's Compendium (SC):** A *Superintendent's Compendium* is produced annually by the park's top administrator and is composed of a series of administrative decisions ranging from entrance fees, speed limits, and, pertinent to this project, recreation closures, fees, and permits. This document is a quicker, less resource-intensive approach to park management than a new management plan. Zion National Park says that an SC "serves as public notice, identifies areas closed for public use, provides a list of activities requiring either a Special Use Permit, Commercial Use Authorization or reservation, and elaborates on public use and resource protection regulations pertaining specifically to the administration of the park" (USDI & NPS, Zion, 2017). *Superintendent's Compendiums* are produced annually and carry law enforcement authority for managers and other national park personnel.

❖ **Management Plans:** Management plans come from multiple years of work involving public comment and revision periods. The NPS states that management plans

"support the preservation of park resources, collaboration with partners, and provision for visitor enjoyment and recreational opportunities. These plans provide the basic guidance for how parks will carry out statutory responsibilities for protection of park resources unimpaired for future generations while providing for appropriate visitor use and enjoyment." (<https://parkplanning.nps.gov/ManagementPlans.cfm>)

These plans must adhere to the National Environmental Policy Act (NEPA) and may be broad (i.e. General Management Plans or Wilderness/Backcountry Management Plans) or focus on one specific topic (i.e. Climbing and Canyoneering Management Plans) (<https://parkplanning.nps.gov/ManagementPlans.cfm>). Management plans require a NEPA review and are therefore much longer and more resource-intensive processes than Superintendent's Compendiums.

- **General Management Plan (GMP):** A GMP is a document required for all national parks designated within the NPS. This document provides direction for each individual park and adheres to upholding aspects of the national park identified within its foundation statement. The GMP provides a clearly defined direction for resource preservation and visitor use specific to each national park. The NPS is also required by the USDI to re-evaluate GMPs every 15-20 years to keep them current and up to date with changes in the national parks. (<https://www.nps.gov/biso>)
- **Wilderness/Backcountry Management Plan or Wilderness Stewardship Plan (W/BMP or WSP):** A W/BMP or WSP is a document much like a GMP, but more specific to wilderness management. These documents are focused on maintaining wilderness character within the national park wilderness areas.
- **Climbing Management Plan (CMP):** A CMP is the most specific management plan to climbing and is not too common. These documents

outline management actions specific to climbing in national parks where climbing is present. Although there are plans to write them in multiple parks where climbing is present, there are only a few which are published and included in management plans online, accessible to the public and all managers within the NPS.

Table 2 illustrates which management documents incorporate DO41, Sec. 7.2.

While most parks include some amount of information within their Superintendent’s Compendium (SC), few parks include information on wilderness climbing and/or wilderness climbing management within other management documents. Also, some national parks did not provide direct links to Superintendent Compendiums and other guiding documents, which required searching for these documents using other search engines.

National Park	DO41, Sec. 7.2 Implementation			
	GMP	W/BMP or WSP	CMP	SC
<b>Black Canyon of the Gunnison</b>	×	×	×	×
<b>Denali</b>	×	×		×
<b>Gates of the Arctic</b>	×			
<b>Joshua Tree</b>		×	×	×
<b>Kings Canyon/Sequoia</b>		×		×
<b>Mount Rainier</b>				×
<b>North Cascades</b>				×
<b>Olympic</b>	×			×

<b>Pinnacles</b>	×		×	×
<b>Rocky Mountain</b>		×		×
<b>Shenandoah</b>				
<b>Wrangell-St. Elias</b>				×
<b>Yosemite</b>				×
<b>Zion</b>		×		×

**Table 2** Director's Order #41, Section 7.2 implementation within guiding management documents.

There is an apparent lack of consistency in the incorporation of DO41, Sec. 7.2 into management documents between the national park units in the sample. Black Canyon of the Gunnison NP is the only national park within the sample to include wilderness climbing information in all the possible documents surveyed. In contrast, Gates of the Arctic NP only implemented DO41, Sec. 7.2 in its general management plan. This stark difference is likely due to the extreme differences between the two national parks. Black Canyon is a popular, accessible, climbing destination while Gates of the Arctic is neither. Hence, it is reasonable for Black Canyon to address climbing management more extensively than Gates of the Arctic. Additionally, Black Canyon has a distinct management plan for climbing that allows the park to specifically state management action for the activity and provide extensive information on climbing management for wilderness managers.

Additionally, twelve of the fourteen parks surveyed provided wilderness climbing information to some extent within the Superintendent's Compendium. While nearly all the national parks in the sample include information on climbing within the Superintendent's Compendium, there is much less consistency within the other guiding documents. The Superintendent's Compendiums are publicly available and offer

information and rules and regulations to users, which is beneficial. However, more consistent inclusion of wilderness climbing management in the other documents would offer more direction to managers for managing wilderness climbing activity.

How DO41, Sec. 7.2's five elements have been implemented into the various management documents was also analyzed and included in Table 3 below. Note that Mount Rainier NP and Yosemite NP are currently writing or starting to write Wilderness Stewardship Plans that will provide information on monitoring impacts from climbing activity in wilderness.

<b>National Park</b>	<b>DO41, Sec. 7.2 Implementation</b>				
	<b>WE</b>	<b>MI</b>	<b>FA</b>	<b>FAAP</b>	<b>LNTE</b>
<b>Black Canyon of the Gunnison</b>		GMP	W/BMP CMP SC	CMP SC	W/BMP CMP
<b>Denali</b>	W/BMP	GMP W/BMP	GMP W/BMP	W/BMP	GMP W/BMP
<b>Gates of the Arctic</b>	GMP				
<b>Joshua Tree</b>	CMP SC	W/BMP	W/BMP SC	W/BMP SC	
<b>Kings Canyon/Sequoia</b>	WSP	WSP	WSP	WSP	WSP
<b>Mount Rainier</b>	SC	*In progress		SC	
<b>North Cascades</b>			SC	SC	
<b>Olympic</b>					
<b>Pinnacles</b>					
<b>Rocky Mountain</b>		W/BMP	W/BMP	SC	W/BMP
<b>Shenandoah</b>					

<b>Wrangell-St. Elias</b>					
<b>Yosemite</b>	SC WSP* (*once written)			SC	
<b>Zion</b>	W/BMP SC	W/BMP	W/BMP SC		W/BMP

**Table 3** Implementation of Main Aspects of Director's Order #41, Section 7.2. The resources indicated within the designated box indicate where information, if any, was located for each of the national parks in the sample. UGI=User Group Information; GMP=General Management Plan; W/BMP or WSP=Wilderness/Backcountry Management Plan or Wilderness Stewardship Plan; CMP=Climbing Management Plan; SC=Superintendent's Compendium; WE=Wilderness Climbing Education; MI=Monitoring Impacts from Wilderness Climbing Activity; FA=Fixed Anchor Placement/Removal Information; FAAP=Fixed Anchor Approval Process; and LNTE=Leave No Trace and "Clean Climbing" Information Present

Table 3 provides data on where the five elements of DO41, Sec. 7.2 are incorporated into management documents. Wilderness/Backcountry Management Plans and Superintendent Compendiums provide the most information on the five elements of DO41, Sec. 7.2. Kings Canyon/Sequoia NP is the only national park in the sample with a current Wilderness Stewardship Plan that addresses all five elements of DO41, Sec. 7.2.

Director's Order #41, Section 7.2 states that if "If climbing activities occur in wilderness, climbing management strategies will be included as part of the park's Wilderness Stewardship Plan, or other activity-level plan" (USDI & NPS, 2013, p. 15). Hence, it is concerning that only three of the national parks in the sample (Black Canyon of the Gunnison NP, Joshua Tree NP, and Pinnacles NP) have Climbing Management Plans, and even these do not cover all the elements of DO41, Sec. 7.2. These two management plans address a variety of aspects of DO41, Sec. 7.2, providing a model for other national parks. Black Canyon's climbing management plan provides an example of how to implement DO41, Sec. 7.2's policy on fixed anchors. Furthermore, Joshua Tree

NP's climbing management plan addresses how the national park has implemented DO41, Sec. 7.2's policy on providing wilderness education to climbers. DO41, Sec. 7.2 states that all national parks should include climbing in their Wilderness Stewardship Plan (WSP) if it occurs in designated wilderness. Kings Canyon/Sequoia NP was the only national park with a WSP that included the elements of DO41, Sec. 7.2 and two other national parks state that they will include elements of DO41, Sec. 7.2 in WSPs that are currently being written. Since having a WSP or activity-level plan with information on climbing is stated in DO41, Sec. 7.2, national parks that do not have this information should address this lack of information.

While only a few national parks analyzed have climbing management plans, all but two of the national parks (Gates of the Arctic NP and Shenandoah NP) provided wilderness climbing information, to some extent, with their Superintendent's Compendiums. There appears to be more law enforcement information guiding management of wilderness climbing than management plans. While nearly all national parks in the sample include information on wilderness climbing within the Superintendent's Compendium, there is much less consistency within the other guiding documents. DO41, Sec. 7.2 states that "If climbing activities occur in wilderness, climbing management strategies will be included as part of the park's Wilderness Stewardship Plan, or other activity-level plan" (DOI & NPS, 2013). The NPS needs to address the absence of climbing from many WSPs, W/BMPs, or activity-level plans (i.e. climbing management plans). Three national parks in the sample have CMPs and six include climbing in their WSPs or W/BMPs. Other national parks could reference Black

Canyon and Zion’s guiding management documents when including climbing in WSPs and writing CMPs if necessary.

Parks have been inconsistent in including information on all aspects of DO41, Sec. 7.2 implementation; the main sources are park-specific compendiums. Only three of the national parks in the sample – Black Canyon of the Gunnison NP, Denali NP, and Rocky Mountain NP – provide information for each of the five aspects of DO41, Sec.7.2. The NPS might examine these inconsistencies to fulfill DO41, Sec. 7.2, which states that “Wilderness parks with climbing use will exchange information on best practices [and] work together on service-wide implementation” (DOI & NPS, 2013). Consistent and complete information in management documents would allow clearer comparisons of how different parks are implementing DO41, 7.2.

### 4.3 Qualitative Findings of Interviews with Park Personnel

Qualitative interviews yielded interesting information on best practices and improving management. To retain anonymity and maintain confidentiality of participants, no quotations include national park names, interviewee information, or any information that could link the quotation to a specific national park. Through a constant comparison analysis process, I have identified five themes in the identification of best practices for management of wilderness climbing: face-to-face communication, relationships with the climbing community, filling information gaps, climbing’s low-priority status, and fixed-anchor management. These themes are presented below with supporting evidence from interview transcriptions. Lastly, social media was mentioned throughout the interviewing process and is discussed at the end of this section.

#### 4.3.1 The Effectiveness of Face-to-face Communication

Interviewees mentioned face-to-face communication numerous times as the most effective form of communication when working with the climbing community and other user groups. One manager emphasized the importance of face-to-face communication, stating that “with education, it's face-to-face contact in the field [that] is almost always the best. It's just a deeper level of communication. You're right on theme to discuss things. You have more credibility if you're out there with people instead of some remote form of education. So that's always the most effective.” It became clear their points on providing a deeper level of communication to discuss wilderness were vital to disseminating wilderness climbing information to the climbing community. Additionally, the concept of credibility is noteworthy. Another manager said that “climbers need to hear from other climbers, not from National Park Service authority. We need to have climbers on staff relate and have credibility with the user group.” Managers can achieve credibility within the climbing community by hiring climbers to serve as climbing rangers. When this is not possible, they can also earn credibility by maintaining relationships with climbing organizations, which will be discussed in Section 3.3.2 below.

Interviewees mentioned a variety of approaches to face-to-face communication with climbers. One method employed in at least five of the national parks interviewed is “Climbers’ Coffee.” During this meeting, rangers go to popular climbing camps, climbing areas, and trailheads to sit down with climbers, share information, and hear concerns. One manager described these meetings: “on busy weekends, particularly, [we] have some law enforcement rangers ... out at trail heads, just offering free coffee and chatting with folks about where they were going. Whether they had any confusions about

routes, etc.” During these informal gatherings, “Rangers... go to the campground where most climbers hang out and give out free coffee and have educational posters and kind of informal talks about wilderness and Leave No Trace.”

While Climber Coffee-type programs provide on-site management of climbers, a few interviewees indicated “outreach to some of the local climbing gyms where [rangers] can communicate Leave No Trace messages and ... Particularly for the gym climbers who may have minimal experience in the outdoors in general, it's an opportunity to present Leave No Trace principles.” With the growth of gym climbing, more individuals are venturing out to local crags that sometimes fall within NPS wilderness. Catching these climbers before they go climbing in the wilderness and educating them on LNT, wilderness climbing, and proper climbing etiquette will help decrease conflict between user groups, wildlife conflicts, and ecological impacts.

Once climbers are out in the field, park personnel use a third, more formal, type of face-to-face communication incorporating “direct one-on-one communication ... with on-mountain enforcement.” While this method of communication is effective, the need for personnel actively on location may make it impractical for large parks with minimal funds to support climbing management.

While on-mountain and at-the-crag enforcement is an effective management strategy for providing information, some statements indicated the possibility of utilizing volunteers to increase face-to-face communication. One manager said that “We currently have ... a low, no-cost way [of communicating], by soliciting volunteers to come to the park and volunteer as climbing stewards. And I think expanding that program would be great.” This type of program utilizing volunteers is a cost-effective and casual way of

providing information. Hence, more programs like the “full-time volunteer program” may be a good solution to sharing information with climbers.

#### 4.3.2 Historical Relationships Between Managers and Users and the Concept of Trust

Relationships between the national parks, climbing community, and local and national climbing organizations represented a major theme in connection to face-to-face communication. The history between certain national parks and climbing communities influenced how specific national parks managed climbing activity. For example, a national park with a positive history with the climbing community felt that they had more freedom to put more management regulations in place. Alternatively, a national park with a more contentious history felt they needed to improve relations before implementing strict management actions like a permit system for climbing. Managers should recognize their influence on the relationship between the national park and climbing community. The discussion below provides examples of cooperative, contentious, and indifferent relationships and their management implications.

There is an apparent ease to management when working relationships are present between the NPS (or a specific national park), climbing organizations (including national organizations like the Access Fund and other local climbing organizations – e.g. Friends of Pinnacles), and climbing communities that use national park wilderness areas. A handful of interviewees spoke to the ease of management with cooperative relationships that emerged from their congruent histories. One national park described “a four-day event that is mostly targeted to people new to climbing, or ... [those] coming from climbing gyms and ... wanna learn about climbing out in parks, in a natural environment.” During this event, NPS personnel and the local climbing organization

“host a table ... that promotes Leave No Trace, and that's kind of a running theme for that annual event.” Collaborations with local climbing organizations provides great opportunities to educate climbers. Such collaborations can support the development and maintenance of a positive local climbing ethic that allows climbers to be largely self-regulating.

One interviewee described a positive relationship with the climbing community as being self-managed: “[climbing activity is] largely managed, I guess, by the climbing community themselves. I think partly because of that the park staff hasn't felt a need to push for more stringent regulations in that regard.” This statement emphasizes that climbing communities often have a local ethic that is consistent with management goals, and climbers are self-regulating. Managers can support a positive local ethic by maintaining relationships with local climbing groups and organizations and providing information to promote LNT, wilderness ethics, etc. Additionally, establishing formalized agreements such as memorandums of understanding (MOUs) with climbing organizations like the Access Fund and other local climbing organizations help solidify working relationships.

In addition to providing education and information to climbers, good relationships with the climbing community also increased trust in one of the national parks interviewed. Responding to a question about monitoring climbing activity in the national park, one manager stated that “just *trusting* that the local climbing community will be fairly responsible, in how they're developing routes, and barring any sort of obvious or egregious acts of vandalism or anything like that.” This statement articulates the concept of trust and that the NPS' ability to trust the responsible climbing community leads to

cooperation. One interviewee mentioned the importance of communication about temporary closures in building trust between rangers and climbers: “[these closures are] communicated to climbers personally, and through email. Through press releases ... too. That's happened a few times over the years, but usually climbers are kind of thrilled by that, because it means at least in the long term, they have greater access to areas.” Thanks to their good relationship, climbers are grateful for closures because they trust the NPS is closing the area to improve access and maintain the resource for future use.

In contrast to the statements above about working relationships, national parks that currently have more contentious relationships with the climbing community take a much more hands-off approach to climbing management. Contentious relationships resulted from current bolting moratoriums and difficult histories between the NPS and climbing community. One national park, when asked about how they implement DO41, Sec. 7.2's policy on fixed anchors said

Well we're not. We allow fixed anchors as long as they're placed by non-motorized drill, anywhere. We have tried for, or have intended for close to thirty years, to write a climbing management plan. We actually wrote one, it's kind of an unusual one, but we actually wrote one in the early '90s. It was finished in '93, but the superintendent wouldn't sign it because of the controversy over fixed anchors and we were going to allow fixed anchors in wilderness in that plan and he was uncomfortable with that. So it never got signed.

Its more contentious history with the climbing community made this national park feel less inclined to implement strict management. There was a lack of *trust* between the climbing community which was apparent by the NPS' desire to not "ruffle feathers" with the climbers. The NPS in this park wanted to approach management by “[working] with the climbers, to have a bottom-up approach instead of the top-down approach [and] try to talk to them about our concerns and work with them and try to make them better.”

Ideally, this approach to management will continue to improve and maintain the relationship between the NPS and the local climbing community. While this is very similar to the statements from national parks with histories of cooperative relationships with the climbing community, there was much more hesitation apparent in imposing any strict regulations. The purpose of having a bottom-up approach to climbing management is to continue to foster a cooperative relationship and improve relations with the climbing community.

Lastly, two national parks emphasized their desire to form working relationships with the climbing community. These NPS personnel articulated that there was minimal communication with the climbing community currently, but that they were interested in starting these conversations. One of these parks indicated that the “park hasn't made many formal connections with organized climbing groups since ... 10 to 15 years ago [but] last spring a climbing organization reached out to the park in wanting to do some volunteering and they did and it was a success.” This park wants to perform “more work with that group, and others, [allowing them] an avenue to educate climbers and for the climbers to make us aware of issues that we see.” The second national park showed an interest in “[doing] a little more focused outreach with some of that user group.... And to get their perspectives on what some of the management issues are.” This respondent elaborated on this point further saying that “It's been awhile since we've had people who monitoring work at the park truthfully, and I think it would be something that's worth re-visiting to say, ‘What are we doing well? What are we not doing so well?’” These parks clearly saw the benefit of using the climbing community to gain knowledge of the current

status of climbing resources. Finding avenues to establish or maintain cooperation is paramount to effective relationships between the climbing community and NPS.

It is essential that trust exists between the NPS and climbing community where wilderness climbing occurs. This is seen with national parks with both cooperative and contentious histories as can be seen in the statements above. Without trust, there is much more hesitation to impose management action. Hence, it is essential that managers first focus on improving and maintaining relationships to ease management and improve trusting relationships with the climbing community.

#### 4.3.3 Need for Scientific Research

There are large information gaps in monitoring climbing activity within NPS wilderness areas. When asked what other information would be beneficial, managers often listed many things that they would like to know about wilderness climbing in their park unit, but this monitoring data was either absent or outdated. For example, one manager said, “it certainly would be interesting to have a better sense of what percentage of climbers are using different cliffs or different rock formations in the park.” Another interviewee emphasized that these information gaps impede management action: “Well, I guess we haven't had that issue at this point because we really don't have enough information to even know what to mitigate.” The NPS has a large gap to fill before much of management action can proceed. Managers need baseline information before they can know what needs mitigation or other management action.

Knowledge gaps are in large part due to lack of resources to collect the information. Even some of the data national parks had was often outdated. One interviewee said “the park completed a climber use survey in 2005 and it looked at

climbing use both in and out of wilderness areas and we have identified the need to revisit those observations and documents.... We've got data but it's dated.” This statement emphasizes that many national parks do not have concrete numbers or observations. This could lead to problems when trying to proceed to managing climbing activity. Without current use information, and only information from many years ago, there is no concrete data to mitigate or manage climbing.

Management strongly desires to gather information on wilderness climbing (e.g. routes, bolts, and numbers of climbers). While multiple interviewees stated that there had been research done monitoring impacts, much information related to climbing impacts is anecdotal and not collected often enough to provide a baseline for future management decisions. One manager emphasized the lack of internal consistency that leads them to constantly re-start data collection: “We have very little data on how many people are out there. We're trying to improve that.... I mean we know anecdotally how many people are out there and which areas are crowded, and which ones aren't and what the seasonal patterns of use are and things like that, but we don't have any hard numbers at all.” This lack of systematic data collection leads managers to make decisions on anecdotal knowledge, studies of other activities (often from hiking and day use data collected), or informal observations rather than concrete data and monitoring strategies. While climbing often has less impact than other use, this lack of data collection on use and impacts could lead management to not know when a trigger is reached for a climbing area and action is needed. DO41, Sec. 7.2 states that “impact monitoring will be [an] important component in climbing management programs (2013, p. 15). Hence, it is important that managers monitor impacts to know when mitigation or some other

management action is needed. While anecdotal data may be sufficient for national parks with less climbing activity, it may not be sufficient for areas with more activity.

In addition to a desire to fill knowledge gaps within single parks, there was also a desire to have more national direction by providing information on what management approaches are used in other national parks. One step toward more national consistency is the development of the Wilderness Climbing Management Network. This national committee's mission is to provide national direction to the park units. The same interviewee said, "With park units it's good to wait for national direction before we get out too far ahead here at the field level." With more national direction, national parks have more of a direction for their park-specific management approaches. While the national parks were founded separately and are intentionally managed differently, groups like the Wilderness Climbing Management Network provide a national vision and source of information for national parks on wilderness climbing management.

#### 4.3.4 Climbing Remains a Low-Priority Recreational Activity

Another theme that emerged from the interviewing process is that climbing remains a low-priority recreational activity for managers, and that other user groups are more problematic. None of the interviewees felt that climbers were a problem user group. One interviewee stated that they have a "relatively small and a generally responsible climbing community, which reduces the impacts that we see and it is even is reducing our accident rate, we have less than one climbing accident a year." Another interviewee said,

climbers, especially local climbers that have been visiting the park for a long time, aren't often the folks that are the largest issue.... They're usually outdoorsy folks that have a good sense of, I'm not leaving trash on the landscape, and part of the reason that they're coming to the park is because they're passionate about the opportunity to climb outdoors and want to keep it that way for people that come after them.

While there was low concern with the climbing activity, interviewees described other user groups as a higher concern. For example, one manager said that “we have no recent information to evaluate that climbing use but compared with other user groups we find that day hikers and overnight campers leave a much larger impact to our back country and wilderness resource than climbers, and so those are really the focus of our efforts.” Managers did not emphasize that climbing was a problematic recreational activity and that there were other recreational activities that were more concerning.

While most climbing activity was considered low-priority for wilderness management, a couple of interviewees mentioned bouldering as an emerging management issue in the parks. Bouldering is a type of climbing but does not utilize fixed anchors and/or protection, but this activity often results in higher impacts than climbing with ropes and fixed anchors and protection as the boulderers remain in one location, with bouldering pads that can have significant impact on vegetation and the ground around the climb (potentially compacting the soil with very high use of one location). Bouldering activity can also have social impacts as boulderers often relax at the base of the boulder while others boulder. On the issue of bouldering increases, one manager said “In recent years, there's also been a proliferation of bouldering in the park, particularly in fragile alpine and sub-alpine areas. These areas are currently witnessing the greatest increase in climbing impacts.” Concerns over the growing bouldering activity in this park were emphasized by the statement, “We've had conversations about actually limiting the number of climbers accessing bouldering areas.” Bouldering was highlighted as the most problematic type of climbing activity in one national park for its sociological and ecological impacts.

#### 4.3.5 Fixed-Anchor Management

Fixed-anchor management emerged through one of the interview questions but was often only briefly discussed. This is notable as fixed anchors are a main element of DO41, Sec. 7.2 and have been deeply contentious throughout the debate of climbing in wilderness, but do not appear to be an area of concern to current wilderness climbing managers. Comments on fixed anchors were more focused on not having a working knowledge of how many existed in the park unit. As one manager said, “So part of the struggle here is the shared number of fixed anchors we'd already have in wilderness. Which no one knows what it is but it's probably 15,000 to 20,000 or something like that. What do you do with those? I don't think anyone wants to go take them out. It just complicates the whole picture.” Without knowledge of how many and where fixed anchors are, managers are to an extent managing them in the absence of any baseline data or ongoing monitoring of impacts and usage.

In addition to lacking knowledge of what fixed anchors exist in some parks, there was also a hesitation to putting strict regulations in place on fixed anchor placement and removal. One manager, when asked about how the park was implementing DO41, Sec. 7.2's policy on fixed anchors, stated, “Well we're not. We allow fixed anchors as long as they're placed by non-motorized drill, anywhere.” This lack of management contrasts with DO41, Sec. 7.2's mandate that “Climbing management strategies will address ways to control, and in some cases reduce, the number of fixed anchors to protect the park's wilderness resources or to preserve the ‘untrammeled,’ ‘undeveloped,’ and ‘outstanding opportunities for solitude’ qualities of the park's wilderness character” (2013, p. 15). The lack of management is not from a lack of trying to manage fixed anchors, but rather a

contentious history between the national park and climbing community. This national park is in the process of determining how to approach management of fixed anchors and other climbing related impacts while maintaining relationships with the climbing community.

Another national park's approach to fixed anchor management is fairly informal and relies on "[their] climbing rangers, trying to get the word out within the climbing community. And then we also have several commercial use authorizations, commercial guided climbing companies that do work in the park. So our climbing rangers interface with them to also reduce fixed anchors." This approach to reducing fixed anchor placement, although not formalized by the national park, can be utilized by other national parks that utilize climbing rangers and commercial guided climbing companies. This approach could also increase the knowledge of how many fixed anchors exist and where they are located.

#### 4.4 The Emerging Benefits of Social Media Use

Social media, although not a major theme identified in the interviewing process, emerged as a notable factor within the data. Multiple managers emphasized the desire to improve social media outreach mechanisms. This desire is captured in the following statements from the interviews:

- I mean I guess some parks might do more online interactive stuff potentially and we haven't really done a whole lot of that just because we have connectivity issues here at the park. I mean, literally the park has three phone lines and a fax line. We don't really have bandwidth. We're working up on that in the future to try to increase our bandwidth and open up the whole world of more interactive electronic media."
- "[We] have a blog throughout the season that is a very effective way to communicate with the climbers and that's ongoing. During the season we're updating regularly every day or usually at least five times a week. We are not very

good as a staff with social media. None of us are very prolific on social media in our personal lives and so we don't really bring it to the table professionally as well. It certainly seems like that's a way to reach people although I'm inherently skeptical of the depth of knowledge on social media. It seems that people will read a sentence or two and then keep swiping and we are more interested in actual knowledge gained, not titles, topics, and headlines. We're not very good with social media.”

- “The park's media team is right now running a media campaign called Explore Responsibly. And they are asking people to hashtag pictures in the park where they are doing Leave No Trace things.”

The first statement mentions limited bandwidth that diminishes the ability of some national parks to utilize online sources. The second and third statements articulate how social media might be beneficial in communicating information to climbers and other park visitors. While this was not the focus of the research, it would be beneficial to address this in a future study.

## SECTION 5. DISCUSSION

This research employed a review of online user group information, a survey review of management documents, and qualitative interviews. The purpose of this approach was to gather information on management's process in a sample of national parks within the United States NPS where wilderness climbing occurs under DO41, Sec. 7.2. The data analysis of the online information, management documents, and qualitative interviews provide information on the implementation of DO41, Sec. 7.2. Additionally, findings from this multi-faceted approach provide a basis to recommend a variety of best practices for wilderness climbing management within the NPS.

## 5.1 Director's Order #41, Section 7.2 Implementation

Director's Order #41, Section 7.2 implementation varied greatly across the national parks in the sample. The review of online information and management documents showed that while most national parks provide extensive information online, the amount and types of information incorporated from DO41, Sec. 7.2 vary greatly. Yosemite NP and Zion NP provide other national parks with good examples to reference when updating climbing pages.

Once the analysis of online information was completed, I surveyed and analyzed management documents for DO41, Sec. 7.2 incorporation. While some national parks covered all the aspects of DO41, Sec. 7.2, none included the information within a single document. Hence, it might be beneficial for the national parks to review these documents and include the aspects they have not covered. While altering management plans would be very resource-intensive and take more time to complete, it would be less resource-intensive to include this information within Superintendent Compendiums and the various types of user group information resources online and in the national parks until Wilderness Stewardship Plans or Climbing Management Plans can be written.

Providing more consistent information without requiring that information and regulations be the same for different national parks would be beneficial for both the climbing community and associated climbing organizations. With more information available, climbers would be able to easily access it. I found that it was very difficult to find information on the NPS websites due to different national parks providing information in different locations in addition to providing conflicting information. This further supports the finding that there should be more consistency among the different

parcs providing information on all elements of DO41, Sec. 7.2. It could be very difficult for a climber trying to access information to find it and climb in accordance with regulations. It is also difficult for managers to find information on how to act when faced with certain management and regulatory actions.

## 5.2 Best Practices for National Park Service Wilderness Climbing Management

There were a variety of best practices identified throughout the data analysis.

These best practices are presented as recommendations from the research and therefore show the researcher’s biases. Table 4 summarizes notable best practices from the research. The best practices are presented as recommendations to the NPS and a brief description of how the best practice can be achieved is included.

Best Practice	Description
<b>Development of Trust</b>	Building trust with the climbing community is essential to management ease. This can be developed by face-to-face communication (Climbers’ Coffee,
<b>Increase Credibility with the Climbing Community</b>	Managers can achieve credibility within the climbing community by hiring climbers to serve as climbing rangers. Also, having climbing rangers out in the field that are associated with the NPS will increase credibility.
<b>Relationship Maintenance with the Climbing Community</b>	Collaboration and open communication with both local and national climbing organizations allow the NPS to develop cooperative relationships. These relationships greatly enhance management in the park units and increase trust between the climbing community and the NPS. This also leads to more trust and cooperation with the climbing community
<b>Relationships with Local and National Climbing Organizations</b>	Maintenance of relationships with national organizations (i.e. the Access Fund, American Alpine Club, etc.) and local climbing organizations that promote climbing and responsible use of the climbing resources will lead to management ease. These relationships can be turned into Memorandums of Understanding (MOUs) to formalize the agreement. The Access Fund also provides information on their website on how to initiate these agreements between the NPS and climbing organizations.
<b>Filling Knowledge</b>	This can be achieved by utilizing outreach mechanisms to potential

<b>Gaps with Scientific Research</b>	volunteers, graduate students in search of graduate research projects, and climbers who have an invested interest in improving the knowledge of what exists for climbing in the area. These outreach mechanisms will decrease resource use and improve the baseline of information managers have to initiate management action.
<b>Providing a Suite of Information Avenues for Users</b>	The more information available to climbers the better. Having more locations where the public can obtain information on wilderness climbing will increase the likelihood that the information will be used to climb properly and in accordance with park policies. The more methods parks can use to share information (NPS websites, brochures, bulletins, permits, videos, social media outlets, etc.), the more likely the public will be able to access the information.
<b>Improvement of Current NPS Websites</b>	It was very difficult to locate a lot of the online information; this required me to spend hours going down metaphorical rabbit holes. Therefore, streamlining online information could greatly improve how informed visitors are before entering the national park. This can be achieved by referencing accessible websites mentioned in this report to improve websites that are less accessible.

**Table 4** Descriptions of identified best practices for managers to reference. These are recommendations that follow from the research that was performed in this study.

### 5.2.1 Good Relationships Yield Great Benefits to the NPS and Climbing Community

National parks that spend the time to not only communicate on the ground with climbers, but also maintain strong relationships with local and national climbing organizations are most successful when implementing mitigation strategies and potential new management actions. Collaboration and open communication with both local and national climbing organizations allow the NPS to develop cooperative relationships. These relationships greatly enhance management in the park units and increase trust between the climbing community and the NPS.

These relationships are the result of histories between the NPS and climbing community. While some national parks are continually mending relationships with the climbing community, others are successfully working with the climbing community

through trust of the system. This trust is developed by collaboratively working with the climbing community, keeping them knowledgeable of the management, and informing them of the reasons for their actions. Managers approach maintaining these relationships and the emergent trust in a variety of ways. The NPS and climbing community can communicate concerns through both face-to-face communication with rangers on the ground and Climbers Coffee. Also, having rangers and climbing stewards out in the field to have deeper levels of communication in the climbing environment is beneficial for maintaining good local ethics within the climbing community.

Many of the interviews mentioned the benefits and effectiveness of relationships with local and national climbing organizations to wilderness climbing management. Examples of national climbing organizations include the Access Fund and American Alpine Club. These climbing organizations promote climbing and responsible use of climbing resources. The Access Fund also emphasizes that there are more and more local climbing organizations emerging. It notes that currently, the Access Fund works with “117 local climbing advocacy organizations across the country. [And that] over the past decade, [they’ve] worked to grow this network by nearly 70%—ensuring that when an access issue occurs in your backyard, there’s a qualified group of advocates there to help” (<https://www.accessfund.org/meet-the-access-fund/our-network>). Additionally, the Access Fund notes that almost all NPS units with climbing areas associate with a local climbing organization. Also, on the Access Fund website, the Access Fund states that it “has a large network of affiliated local climbing organizations across the country” that are eager to partner with federal and state agencies to “support ... land management priorities” (<https://www.accessfund.org/learn/for-land-managers/working-with-your->

local-climbing-organization). The Access Fund also provides detailed instructions on how to start a relationship with a local climbing organization. Utilizing local and national climbing organizations will increase good relationships between the NPS and climbers and foster cooperation.

### 5.2.2 Filling Knowledge Gaps by Gathering Baseline Data and Centralized Databases

National parks have large knowledge gaps where data was once collected but is no longer relevant. Additionally, managers do not always know who is climbing, where they are climbing, how many bolts there are, how many routes there are, or their locations. These large knowledge gaps provide a weak baseline to start thinking about climbing management. Therefore, collection of baseline data is essential for the national parks' knowledge of vital information about climbing activity, installations, and users' desires. This data collection should be focused on both the sociological impacts (i.e. climber and other use groups' thoughts on climbing activity in the national parks) of climbing and the resource impacts (i.e. erosion at various sites of climbs, social trails, bolt impacts and locations, route locations, etc.). This would be a very resource-intensive process but could include work from graduate students, volunteers, and park personnel to decrease costs and resource use for the data collection. Utilization of a variety of outreach mechanisms to attract graduate students and other citizens/volunteers would assist gathering this baseline data. Once the data is collected, there would need to be an analysis of the information and then management decisions could be made with more concrete facts backing them.

In addition to providing more concrete information for management actions and decisions, national parks could compile this research into centralized databases, allowing

them to help fulfill DO41's mission to share information agency-wide. It would also allow managers to compile and compare information over the years without having disparate studies that are in no set physical location. This could lead to adaptive management of wilderness climbing within the national parks with set triggers that are identified throughout the process of collecting data.

### 5.2.3 Providing a Suite of Information Avenues and Improving Access

Having more locations where the public can obtain information on wilderness climbing will increase the likelihood that the information will be used to climb properly and in accordance with park policies. The more methods parks can use to share information (NPS websites, brochures, bulletins, permits, videos, social media outlets, etc.), the more likely the public will be able to access the information. Additionally, it was very difficult to locate a lot of the online information; this required me to spend hours going down metaphorical rabbit holes. Therefore, streamlining online information could greatly improve how informed visitors are before entering the national park.

### 5.3 Research Limitations

One major limitation to the study was the small sample size. While there were many great observations made from the data collected, a larger sample size would allow for more inferences to be made. Additionally, there were a few national parks within the sample that did not feel that climbing was on the radar for their current management priorities and therefore had very little to say about management practices.

Another limitation of the study was that I could only conduct one interview in person; the rest were conducted via telephone, which does not allow me to gather as

much detail. Telephone interviews can also be more difficult to fully document. When the person is directly in front of the researcher, conversation is more fluid and allows for more in-depth conversation.

#### 5.4 Areas for Future Research Studies

Future research on social media use would be stimulating as it was mentioned in a few interviews as an object of interest that was not currently being fully utilized.

Additionally, identifying ways to use social media while still providing the breadth of information that park personnel want users to know would be a very interesting study.

This research could help national parks fully embrace social media to share information with different user groups to the parks.

Another interesting study, which was mentioned through the interviewing process, would be a project based on bouldering. This activity has much higher impact than most vertical climbing in national parks and is therefore of concern to some of the national park personnel interviewed. Research focused on how to mitigate these impacts and work with this user group would help park personnel with management decisions.

In addition to addressing bouldering issues, another interview brought to attention the lack of a quantitative measurement for solitude. The question, “How do we manage for solitude?” was mentioned in this interview by the interviewee. This question relates to climbing in all regards, whether it is climbers’ access to solitude or their effect on the solitude of others. It is a main tenet of wilderness character without a protocol for measuring it in relation to climbing activity. Therefore, a research project could focus on developing a quantitative way to measure experiences of solitude in wilderness when there are individuals pursuing multiple recreational endeavors.

Lastly, replacing bolts was mentioned by the interviewee. This interviewee emphasized that replacing bolts is essential and that this might be an instance where climbers should use power drills in wilderness. This is a highly controversial topic as mechanized tools are not accepted in wilderness. Therefore, research on this would be very interesting to the NPS and other agencies who manage for wilderness climbing.

## SECTION 6. CONCLUSION

While there are a variety of approaches to management, a method that might be appropriate for a park with a long history of cooperative relations with the climbing community may not be suited for a park with a more contentious history. It is important for the national parks to retain their individuality based on their foundation statement, but there should be more consistency with providing all aspects of DO41, Sec. 7.2 for each specific national park. Management does not need to be identical for all national parks' wilderness climbing, but there is an apparent lack of consistency in providing information on climbing management required by DO41, Sec. 7.2.

In addition to this inconsistency, it is apparent that the large knowledge gaps within the national parks on climbing activity greatly hinder DO41, Sec. 7.2 implementation. These knowledge gaps may prevent managers from being able to manage with complete confidence or implement new management action. It is essential to record baseline data in national parks with high climbing activity if management action and mitigation are needed. Although climbing is currently a low-priority recreational activity, there is potential for increases in problems as the activity continues to grow in popularity. Therefore, it is important that wilderness managers gain concrete knowledge

of what they are managing and maintain cooperative relationships with the climbing community and climbing organizations.

Lastly, one of the main goals of DO41 is consistency throughout the NPS on implementation of policy. My review of online information found this is absent. These inconsistencies imply that more place-based management approaches are appropriate. While national direction is important for general approaches, embracing the park-specific approaches to management in the national parks will be most beneficial. A national, blanket policy on all elements of DO41, Sec. 7.2 contrasts with the foundation of the NPS based on varying geographical and social histories in different national parks. This conclusion supports research performed by Preisenderfer (2008) and Murdoch (2010) that management for recreation in parks should be highly park-specific due to the site-specific needs of different national parks. Each park is unique, and so should their management approaches.

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## APPENDIX A

<b>National Park Service Unit</b>	<b>National Park Service Wilderness Area</b>
Black Canyon of the Gunnison	Black Canyon of the Gunnison
Denali	Denali
Gates of the Arctic	Gates of the Arctic
Joshua Tree	Joshua Tree
Mount Rainier	Mount Rainier
North Cascades	Stephen Mather
Olympic	Daniel J. Evans
Pinnacles	Hain
Rocky Mountain	Rocky Mountain National Park
Sequoia & Kings Canyon	Sequoia & Kings Canyon and John Krebs
Shenandoah	Shenandoah
Wrangell-St. Elias	Wrangell-St. Elias
Yosemite	Yosemite
Zion	Zion

**Table 5** National Park Service Units and Congruent Wilderness Areas. These NPS wilderness areas were all included in the review and analysis of online information while Gates of the Arctic NP and Olympic NP were excluded from the qualitative interviews.

## APPENDIX B

### Telephone Interview Guide

Hello, my name is Kerry Sullivan. I am a graduate student at the University of Montana in the Department of Society and Conservation. I am calling to invite you to participate in a research study about best management practices for climbing in Wilderness within the National Parks.

Your participation in this study is completely voluntary. This means that you do not have to participate in this study unless you want to.

The purpose of the research is to better understand what management actions have been implemented and how effective these strategies have been while evaluating how to make Director's Order #41, Section 7.2, more effective.

There are no anticipated risks or benefits with your participation in this study.

If you have any additional questions about this study after this interview, you can contact me, Kerry Sullivan, by email at [kerry.sullivan@umontana.edu](mailto:kerry.sullivan@umontana.edu) or by phone (802) 522-7027 or my faculty supervisor, Dane Scott, email [dane.scott@mso.umt.edu](mailto:dane.scott@mso.umt.edu) or by phone at (406) 243-6632.

If you have any questions regarding your rights as a research subject, contact the UM Institutional Review Board at (406) 243-6672.

I can email or send you a copy of all the information I just read to you if you would like.

Do you agree to be in this study?

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#### *Start of Interview*

We have identified several management actions for climbing in wilderness contained in Director's Order #41, Section 7.2. We are interested in how they are being implemented and identifying best practices for wilderness climbing management.

#### *Opening question:*

Tell me about your experience with Directors Order #41?

Are you familiar with other parks' approaches to implementation of Director's Order #41, Section 7.2?

*Start of Direct Interview Questions*

1. How is the park implementing Director's Order #41, Section 7.2's policy on fixed anchors?

Follow-up questions to #1:

- How is the park's approach to fixed anchors best suited to the site-specific needs of the park's wilderness climbing resource?

2. What type of wilderness education exists for climbers at your unit? Can you describe process or procedures utilized?

Follow-up questions to #2:

- What education strategies are most successful? Please explain.
- Can you describe models of education for climbers that might be beneficial at your wilderness area?

3. If Leave No Trace is part of your management plan, can you explain how it is promoted?

Follow-up questions to #3:

- Does the park specifically encourage climbers to practice Leave No Trace principles? If so, how does the park encourage this?
- What outreach mechanisms work best for climbers? Please explain.
- What would make such efforts more effective with climbers? Please explain.

4. Is information collected on climbers' use of wilderness areas? Describe the ways you collect information about climbers in wilderness areas. What type of info do you collect? If information is not collected on climbers' use of wilderness, do you think it would be beneficial to collect this type of information?

Follow-up questions to #4:

- Are efforts made to determine acceptable levels of change for climbing sites for wilderness climbing areas? If so, what methods are used to determine this?
- Does the park compare the measured use levels to the determined acceptable levels of change for climbing sites? If so, how does the park unit do this?

5. Are impacts from climbing monitored in your park? Describe how your park unit monitors impacts from climbing.

Follow-up questions to #5:

- How does the park decide when to implement mitigation strategies for climbing activity in wilderness?

Lastly, are there any additional comments you would like to add?

Thank you very much for taking the time to speak with me. Please feel free to contact me with any questions and if you have any more comments you would like to add.

## APPENDIX C

### 7.2 Climbing

For the purpose of this Order, climbing is defined to include climbing, snow and ice climbing, mountaineering, canyoneering, and caving, where climbing equipment, such as ropes and fixed or removable anchors, is generally used to support an ascent or descent. The NPS recognizes that climbing is a legitimate and appropriate use of wilderness. However, any climbing use or related activity must be restricted or prohibited when its occurrence, continuation, or expansion would result in unacceptable impacts to wilderness resources or character or interfere significantly with the experience of other park visitors.

If climbing activities occur in wilderness, climbing management strategies will be included as part of the park's Wilderness Stewardship Plan, or other activity-level plan. Wilderness parks with climbing use will exchange information on best practices, work together on service-wide implementation, and communicate with stakeholders and wilderness users. Wilderness climbing education and impact monitoring will be important components in climbing management programs. It is recognized that the use of removable anchors may reduce, but does not in every case completely eliminate, the need for fixed anchors. The occasional placement of a fixed anchor for belay, rappel, or protection purposes does not necessarily impair the future enjoyment of wilderness or violate the Wilderness Act. However, climbing practices with the least negative impact on wilderness resources and character will always be the preferred choice.

The establishment of bolt-intensive face climbs is considered incompatible with wilderness preservation and management due to the concentration of human activity which they support, and the types and levels of impacts associated with such routes. Climbing management strategies will address ways to control, and in some cases reduce, the number of fixed anchors to protect the park's wilderness resources or to preserve the "untrammled," "undeveloped," and "outstanding opportunities for solitude" qualities of the park's wilderness character.

Fixed anchors or fixed equipment should be rare in wilderness. Authorization will be required for the placement of new fixed anchors or fixed equipment. Authorization may be required for the replacement or removal of existing fixed anchors or fixed equipment. The authorization process to be followed will be established at the park level and will be based on a consideration of resource issues (including the wilderness resource) and recreation opportunities. Authorization may be issued programmatically within the Wilderness Stewardship Plan or other activity-level plan, or specifically on a case-by-case basis, such as through a permit system. Prior to the completion of the park's Wilderness Stewardship Plan or other activity-level plan, the park superintendent may approve new fixed anchors or fixed equipment on a case-by-case basis.

If unacceptable impacts are occurring in wilderness as a result of climbing, the park superintendent may deem it necessary to restrict or prohibit the placement of fixed anchors. Proposals for the placement of fixed anchors or fixed equipment for the administrative purpose of facilitating future rescue operations must be evaluated through a MRA.

“Clean climbing” techniques should be the norm in wilderness. This involves the use of temporary equipment and anchors that can be placed and removed without altering the environment (e.g. slings, cams, nuts, chocks, and stoppers). Practices such as gluing or chipping holds, and damaging or removing vegetation on or at the base of climbing routes, are prohibited by NPS regulations (36 CFR 2.1). The use of motorized equipment (e.g. power drills) is prohibited by the Wilderness Act and NPS regulations (36 CFR 2.12). Climbers are encouraged to adopt Leave No Trace principles and practices for all climbing activities, including packing out all trash and human waste.

## APPENDIX D

<b>National Park</b>	<b>Guiding Document(s)/Type of Policy</b>	<b>Climbing Management</b>
Black Canyon of the Gunnison	Superintendent's Compendium, 2017	Includes regulations for climbing in the park
	Wilderness and Backcountry Management Plan and Environmental Assessment, 2011	Within Appendix C, "Climbing Management Plan" specifically addresses climbing management
Denali	Superintendent's Compendium, 2017	Mentions climbing permits and waste disposal
	Backcountry Management Plan, 2006	Environmental assessment of alternatives, climbing mentioned throughout document in reference to alternatives
Gates of the Arctic	General Management Plan, 1986, with 2016 General Management Plan Amendment, 2016	Wilderness Stewardship Plan (WSP) provided in amendment, climbing mentioned extensively throughout environmental assessment in WSP
Joshua Tree	Superintendent's Compendium, 2017	Indicates closures, pertinent climbing information and regulations, and regulations on wilderness recreation use
Kings Canyon/Sequoia	Superintendent's Compendium, 2017	Indicates enforced seasonal climbing closures, regulations for climbing closures
	Wilderness Stewardship Plan, 2015	Within Appendix J, "Climbing Management Strategy" specifically addresses climbing management
Mount Rainier	Superintendent's Compendium, 2017	Climbing permit fees, registration with the superintendent for climbing activities, wilderness use and management/regulations
North Cascades	Superintendent's Compendium, 2017	Enforces a moratorium on all new fixed anchors in designated wilderness, defines climbing and fixed anchors, indicates recreation fees for climbing
Olympic	Superintendent's Compendium, 2017	No use of power drills in designated wilderness, Special Public Use Fee and Backcountry Use Permit indicated,
	General Management Plan, 2006	Minimal mention of climbing presented in General Management

		Plan environmental assessment
Pinnacles	Superintendent's Compendium, 2017	Presents technical climbing regulations, group size limits, climbing closures articulated, specific and highly regulated wildlife climbing closures,
	General Management Plan, 2012 (draft)	Climber Access Plan and Raptor Monitoring Protocol, also articulates plan to complete a Climbing Management Plan
Rocky Mountain	Superintendent's Compendium, 2017	Wilderness bivouacs, backcountry/wilderness permits, bivouac permits are exclusively for technical climbers and ski mountaineers; designated bivouac areas (very specific rules for where and when can use)
	Backcountry/Wilderness Management Plan, 2001	Large section on climbing management in ROMO includes management information on litter, erosion, social impacts, noise, wildlife considerations, visual impacts from chalk, and hardware placement (fixed anchors placed judiciously)
Shenandoah	Not included in guiding documents	Not applicable
Wrangell-St. Elias	Superintendent's Compendium, 2017	Some information provided on commercial use regulations
Yosemite	Superintendent's Compendium, 2017	Fixed anchors may be placed and remain indefinitely, motorized drill use prohibited in designated wilderness, bivouacking on big wall climbs do not require a permit, other overnight camping requires a permit, waste disposal regulations
Zion	Superintendent's Compendium, 2017	Closures for peregrine falcon nesting regulated, placement of fixed anchors for bolt-intensive face climbs (sport climbs) is prohibited in designated wilderness, group size limits in Zion wilderness, climbing requires a permit, permit required for activity which will last longer than 24 hours
		Encourage use of neutral, earth-toned equipment, waste disposal, erosion considerations articulated, closures

	Backcountry Management Plan, 2007	should be considered in the Pristine Zone and should last only as long as absolutely necessary to protect the resource (wildlife, vegetation, etc.)
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**Table 6** Guiding documents identified through the analysis of online information which provide implementation of Director's Order #41, Section 7.2 on wilderness climbing management. Some national park units provide implementation in multiple documents while others provide implementation in one document or no documents (no legal, guiding documents).

<b>National Park</b>	<b>Monitoring Climbing Impacts Integration in Policy</b>
Black Canyon of the Gunnison	Yes, included in Black Canyon of the Gunnison National Park and Curecanti National Recreation Area Management Plan. Monitoring peregrine falcon and other nesting species; “This Plan contains a management framework to monitor wilderness character and take action if conditions change”
Denali	Yes, provided in the Denali National Park and Preserve Final Backcountry Management Plan as well as the Consolidated GMP
Gates of the Arctic	No information on monitoring impacts from climbing
Joshua Tree	Yes, in preferred alternative in the Backcountry and Wilderness Management Plan's section on Climbing Management
Kings Canyon/Sequoia	Yes, provided in Wilderness Stewardship Plan and Climbing Management Strategy in Appendix J of the WSP
Mount Rainier	Indicate that the park is currently working on developing triggers and standards to base monitoring protocols on
North Cascades	No monitoring specific to climbing activity identified
Olympic	No monitoring specific to climbing activity identified
Pinnacles	The park would like to monitor impacts, but does not currently have a protocol for monitoring. Explicitly states the park does not monitor bolts or anchor sites (climbers need to acknowledge risk)
Rocky Mountain	Yes, provided in the Backcountry/Wilderness Management Plan
Shenandoah	Not able to locate any information on monitoring – state that locations are monitored in the Climbing Guidelines document
Wrangell-St. Elias	No monitoring specific to climbing activity identified
Yosemite	No monitoring specific to climbing activity identified. What monitoring does occur is focused on raptor information and pertinent closures
Zion	Yes, information provided in the Climbing and Canyoneering Management section of the Backcountry Management Plan and Environmental Assessment

**Table 7** Wilderness climbing monitoring policy implementation in the different national park units from the analysis of online information. Locations of policy implementation within the guiding documents are presented to provide direction to future management reference.

<b>National Park</b>	<b>Fixed Anchor Information Presented</b>
Black Canyon of the Gunnison	Yes, provided in Interim Climbing Management Plan, 2017 Superintendent Compendium, and Wilderness and Backcountry Management Plan and Environmental Assessment
Denali	Yes, provided in the Denali National Park and Preserve Final Backcountry Management Plan and Consolidated GMP
Gates of the Arctic	No information presented on fixed anchor placement
Joshua Tree	Yes, provided in the Backcountry and Wilderness Management Plan, Superintendent Compendium, and on NPS Website
Kings Canyon/Sequoia	Yes, provided in the Wilderness Stewardship Plan within the Climbing Management Strategy section
Mount Rainier	No information presented on fixed anchor placement
North Cascades	Fixed anchor moratorium currently in effect in NOCA. Written on NPS Website and in Superintendent Compendium
Olympic	No information presented on fixed anchor placement
Pinnacles	Present information on NPS website. Not written into any guiding document analyzed
Rocky Mountain	Yes, provided in the Backcountry/Wilderness Management Plan
Shenandoah	Information provided in the Climbing Guidelines document. Not written into any guiding document analyzed
Wrangell-St. Elias	No information presented on fixed anchor placement
Yosemite	Present information on NPS website. Not written into any guiding document analyzed
Zion	Yes, provided in Backcountry Management Plan and Environmental Assessment and Superintendent Compendium

**Table 8** Fixed anchor information presentation in the different national park units from the analysis of online information. Locations of policy implementation within the guiding documents are presented to provide direction to future management reference.

National Park	Approval/Authorization of Fixed Anchors
Black Canyon of the Gunnison	Yes, included in the Interim Climbing Management Plan and Superintendent’s Compendium. Authorization comes from “park staff” for placement and removal of fixed protection (need clarity on who is “park staff”)
Denali	Yes, provided in the Denali National Park and Preserve Final Backcountry Management Plan (BMP). From BMP: “When a climber determines the need for anchor placement or replacement, this must be accomplished in compliance with regulated and permitted standards (for example, power drills may not be used).”
Gates of the Arctic	NPS website. Process needs approval from the park superintendent.
Joshua Tree	Yes, provided in the Superintendent’s Compendium and Backcountry Management Plan. From Compendium: Must be authorized by the Park Superintendent. From BMP: “Replacement of existing fixed anchors would be accomplished in a manner that removes the old fixed anchor with minimum damage to the rock resource. Power drills could be used in the developed zone and the backcountry transition subzone with a permit. Placement of fixed anchors in the developed zone and backcountry transition subzone would not require a permit, but a monitored process would be established to provide guidance and management oversight. The monitored process would be developed with the assistance of the Climbing Committee. A cap would be placed on the number of new climbing routes using fixed anchors (bolts)... Placement of any new fixed anchors in wilderness should require prior approval in the form of a permit by the Superintendent, and any climbing impacts in wilderness should not exceed 1998 levels. Fixed anchor free zones would be created in the park” (p. 4)
Kings Canyon/Sequoia	Yes, provided in the WSP within the Climbing Management Strategy. Permit system in place. From WSP: Per DO #41 “Proposals for the placement of fixed anchors or fixed equipment for the administrative purpose of facilitating future rescue operations must be evaluated through a MRA. [Minimum Requirement Analysis]” The parks may place and maintain permanent or removable fixed anchors for administrative and emergency purposes, but only after a MRA is completed, with the exception of emergencies. The NPS will not, as policy or practice, monitor any fixed anchors to evaluate their condition or accept any responsibility for the soundness of fixed anchors. The NPS, when it encounters them during park operations, may remove those fixed anchors deemed unsafe, unnecessary, or intrusive to wilderness.”
Mount Rainier	Yes, provided in Superintendent’s Compendium and on NPS Website. Required to pay a Climbing Cost Recovery Fee and obtain

	a climbing permit; registration with the Park Superintendent is required prior to and upon return from any climbing in MORA (Superintendent Compendium)
North Cascades	Yes, explicitly states that there is a moratorium on placing new fixed protection in the Superintendent's Compendium. States that "Current National Park Service Policy, Director's Order 41 (Wilderness) issued May 13, 2013, prohibits installation of new fixed anchors unless specifically authorized through a plan or through a permit system. Until the Park can meet this planning requirement or approves a permit, fixed anchors (bolts) remain prohibited" (p. 4)
Olympic	No information found on authorization of fixed anchor placement.
Pinnacles	No information found on authorization of fixed anchor placement.
Rocky Mountain	No permit or approval system currently in place. Do require a bivouac permit if staying overnight (provided in the Superintendent's Compendium)
Shenandoah	No information found on authorization of fixed anchor placement.
Wrangell-St. Elias	No information found on authorization of fixed anchor placement.
Yosemite	No process currently in place; fixed anchors may be placed and kept in place indefinitely
Zion	No information found on authorization of fixed anchor placement.

**Table 9** Fixed anchor approval/authorization policy in the different national park units from the analysis of online information. Locations of policy implementation within the guiding documents are presented to provide direction to future management reference.

National Park	Leave No Trace and “Clean Climbing” Integration
Black Canyon of the Gunnison	Yes, LNT mentioned in Wilderness and Backcountry Management Plan, Interim Climbing Management Plan, and on NPS Website. From NPS Website: “Practice Leave No Trace while in the canyon. Littering will not be tolerated.” Clean climbing briefly mentioned in Interim Climbing Management Plan (not elaborated on what that means)
Denali	Yes, extensively covered in Backcountry Management Plan, Consolidated GMP, and on NPW website. Leave No Trace guidelines are currently being written to guide how LNT should be applied to the landscape (management plans). Clean climbing not mentioned in any documents.
Gates of the Arctic	On NPS website, LNT is promoted.
Joshua Tree	Yes, promoted online. Not written explicitly in climbing management of the park unit. "Clean Climbing" mentioned on park website on the "Good Climbing Practices" page: “Avoid altering the rock by ‘nailing’ or ‘gardening.’”; “Never fabricate holds or change the nature of established climbs.”; “Do not anchor or tie-off on vegetation.”; and “Use neutral or rock-colored stainless steel fixed anchors and corresponding hangers, rappel rings, quick links, and chains.”
Kings Canyon/Sequoia	Yes, provided in Climbing Management Strategy and on the NPS website. State in the Climbing Management Strategy that “Clean-climbing techniques are generally the norm” ( J-3). Also in Climbing Management Strategy state that: “The parks will conduct a strong educational effort promoting minimum impact techniques and sound climbing ethics as outlined in Leave No Trace© Outdoor Skills and Ethics: Climbing booklet in general, and specifically these parks’ wilderness regulations and restrictions. The parks will maintain a ‘Climbing’ page on the parks’ official website (www.nps.gov/seki), which will contain this strategy, and other climbing guidelines, rules and restrictions pertaining to climbing, as well as pertinent links to related websites. This page will also communicate any information on removal of fixed-anchors, performed by the climbing community or the parks” (J-3)
Mount Rainier	Within Climbing Bulletin (linked from NPS website Climbing page): low impact camping and climbing are encouraged. Do not use LNT or clean climbing language in any resource analyzed, but encourage low impact practices.
North Cascades	Reference the Ross Lake General Management Plan (2012) which uses LNT promotion. Neither LNT nor clean climbing mentioned on NPS website
Olympic	No information provided using LNT ethics or clean climbing techniques

Pinnacles	No information provided on using LNT ethics or clean climbing techniques
Rocky Mountain	Yes, strongly encouraged to use LNT within the Backcountry/Wilderness Management Plan and on the NPS website.
Shenandoah	Yes, articulated/promoted on NPS website. Encouraged to use practice clean climbing, but no explanation to what this entails
Wrangell-St. Elias	No information provided on using LNT ethics or clean climbing techniques
Yosemite	<p>Yes, encourage LNT practices, but do not use LNT specific language on NPS website.</p> <p>Following information is provided on Climbing page on NPS website:</p> <ul style="list-style-type: none"> <li>- “Fight litter! Don't toss anything off a wall, even if you intend to pick it up later. Don't leave food or water at the top or on ledges for future parties. Set a good example by picking up any litter you see, including tape wads and cigarette butts.</li> <li>- Don't leave fixed ropes as permanent fixtures on approaches and descents. These are considered abandoned property and will be removed.</li> <li>- Minimize erosion on your approach and descent. If an obvious main trail has been created, use it. Go slow on the way down to avoid pushing soil down the hill. Avoid walking on vegetation whenever possible.</li> <li>- If you need to build a fire for survival during an unplanned bivouac on the summit, use an existing fire ring. Building a new fire ring or windbreak is prohibited. Make sure your fire is completely out before you leave.</li> <li>- Clean extra, rotting slings off anchors when you descend. Bring earth-toned slings to leave on anchors.</li> <li>- On first ascents: Please think about the impacts that will be caused by your new climb- Is the approach susceptible to erosion? Is there a lot of vegetation on the rock? "Gardening" (i.e., killing plants), is illegal in Yosemite. Can the climb be done with a minimum of bolts? Motorized drills are prohibited.”</li> </ul> <p>Utilize a highly hands-off approach to LNT promotion</p>
Zion	Yes, emphasized on NPS website. Encourage low impact climbing. LNT also included in Backcountry Management Plan. Low impact climbing is encouraged without LNT language throughout the Climbing and Canyoneering Management section of the Backcountry Management Plan

**Table 10** Fixed anchor information presentation in the different national park units from the analysis of online information. Locations of policy implementation within the guiding documents are presented to provide direction to future management reference.

## APPENDIX E: RESEARCH METHODS

### **Research Design**

To gain an understanding and documentation of how DO41, Sec. 7.2 is being implemented in the national parks, online information was analyzed. This aspect of the research allowed for a baseline of information to be collected and provide context for the interview guide. The interview guide was developed to provide more information on how DO41, Sect. 7.2 is being implemented.

### ***Collection of Online Material***

The collection of online information involved analyzing two types of information. First, information that was presented to the public through NPS websites was assessed on whether three elements of DO41, Sec. 7.2 were present. These three elements included: wilderness education, fixed anchor placement/removal, and LNT education. The second analysis of information assessed what management material is present. This information was gathered by searching for relevant information on the individual NPS websites as well as analyzing relevant documents including general management plans, activity-level management plans (i.e. climbing management plans) when possible, and superintendent compendiums. The five measurable elements of DO41, Sec. 7.2 were included in this analysis. These measurable elements included: wilderness climbing education, monitoring climbing impacts, fixed anchor placement/removal, fixed anchor approval process, and LNT/"clean climbing" education.

### ***Data Analysis of Part 1***

Online user group information was analyzed and notes were made on what information was present for each national park in relation to DO41, Sec. 7.2 in an Excel spreadsheet. Secondly, I performed a content analysis of management documents by locating the documents online and then combing through each individual management document to determine if the five elements of DO41, Sec. 7.2 were included in the management plans and superintendent's compendiums. This information was also documented in an Excel spreadsheet. These two spreadsheets were inherently informative for the research and helped with conducting interviews with managers from the different national parks. The goal of part one of the methodology was to answer research questions: 1. In response to Director's Order #41, Section 7.2, Climbing, what management actions have park units implemented regarding wilderness climbing?

### ***Qualitative Interviews***

A vital aspect of collecting information for this research was analyzing DO41 and specifically DO41, Sec. 7.2. Specifically, information collected from DO41, Sec. 7.2, and RM41 helped inform the development of the interview guide. This vital aspect of the project not only informs the interview guide, but also allowed me to have detailed knowledge of what the national parks have published so that conversation remained

relevant to the specific park. This allowed for probing the interviewee as well as being able to coherently follow comments from the interviewee.

Qualitative interviews were conducted to further answer how DO41, Sec. 7.2 is being implemented as well as which management actions wilderness managers identify as best practices. In addition to helping answer the first two research questions, the interview questions were also designed to address how wilderness managers think management could be made more effective.

### *Sample Description*

There are 765 wilderness areas, totally 109,138,248 acres, in the United States. Of the land in the United States, the NPS manages thirteen-percent of federal lands and forty-percent of the acreage within NWPS. This results in the NPS utilizing fifty administrative offices to manage sixty-one wilderness areas (wilderness.net). Of these wilderness areas, there are approximately thirty-seven areas where climbing is documented, or conditions exist where it could occur (wilderness.net; mountainproject.com; summitpost.com; rockclimbing.com). Although thirty-seven NPS wilderness areas have potential climbing present, the NPS recognizes fifteen locations where wilderness and climbing coincide (<https://www.nps.gov/findapark/advanced-search.htm?a=32&p=1&v=0>). This distinction is made based on NPS websites which include both climbing (including climbing and mountaineering) and wilderness on their website. This information was found by using the “Advanced Search Tool” (<https://www.nps.gov/findapark/advanced-search.htm?a=32&p=1&v=0>) which can be used to filter national parks by state, activity, and topic (wilderness is included under the topic filter). All thirty-seven areas were initially included in the search and assessed for whether climbing and wilderness were included on their websites. After this initial search, only fifteen of the national parks included climbing and wilderness on their NPS website. Upon contacting the fifteen national parks, Glacier Bay National Park and Preserve was excluded due to lack of climbing activity in the area emphasized by the national park employees. The other fourteen locations were the focus of the interviews for this study due to their public information on climbing in wilderness being available to the public and therefore more easily assessed on how its implementation is going (refer to Appendix A, Table 5 for a list of NPS wilderness areas included in the study).

The population for this research included all national parks with designated wilderness where climbing occurs. It is possible that some national parks were not identified in the sampling process and therefore not included in the sample of interview. To gather information on the park units’ management, the sample utilized for the telephone interviews included at least one interview from each national park unit in the park where the NPS indicates that both climbing and wilderness exist. Cross referencing determined these fourteen park units where the NPS has information on climbing existing in the park with national park units which contain designated wilderness.

## *Participants*

The participants involved in the study included both female and male participants who serve in some capacity in wilderness climbing management in the NPS. The study included at least one interview from fourteen national parks throughout the United States where climbing and wilderness coincide. The sampling techniques utilized for this study included both purposeful and snowball sampling. The purposeful sampling included contacting the wilderness coordinator of the national park to identify the proper individual to contact. Snowball sampling occurred when it was more difficult to locate the proper individual by contacting the wilderness coordinator. When snowball sampling was required, individuals from the NPS, Leave No Trace Center for Outdoor Ethics, and the Access Fund were contacted to “[identify] ... participants who fit the study’s criteria and then [asked] these people to suggest a colleague [or] a friend” (Tracy, 2013, p. 136). Participants were emailed asking them to partake in the study and no incentive was given. The enrollment email provided enough information to the participants to allow them to understand the purpose of the study. Additionally, the interview guide was attached to the email to allow the NPS personnel to prepare for the interview. Important to note is that the researcher is a climber and able to relate to the participants and understand the climbing jargon utilized. Climbing is a subculture in recreation and association with the sport includes understanding this jargon.

## *Development of the Interview Guide*

The interview guide was created in direct reference to DO41, 7.2 and designed to generate information that cannot be gathered from online and print information. Director’s Order #41, Section 7.2 was analyzed, and each management action indicated in the section of the Order was integrated into a question in the interview guide. The goal of the interview guide is to answer the second and third interview questions which are: 2. Which management actions from Director’s Order #41, Section 7.2 do managers in these parks identify as best practices? and 3. How do managers think management can be made more effective? An interview guide (Appendix B) was utilized “to stimulate discussion rather than dictate it” (Tracy, 2013, p. 139). This type of interview was utilized to allow for more in-depth information gathering about DO41, Section 7.2 implementation in NPS wilderness areas. The structured interviews guided by an interview guide prevented the researcher from incorporating too much bias into the interviewing process – as the researcher is a climber with biases.

## *Interviews and Transcription*

The researcher acted as an external tool to gather information through interviews. Interviews were almost entirely administered on the telephone due to not being able to travel to the various national parks to meet with the NPS employees. One interview was administered in person due to proximity of the employee. Informed consent adherent to the Institutional Review Board (IRB) proposal, which was cleared for the research project, was gained by the interviewer explaining the informed consent form (Appendix C) and the voluntary nature of their involvement in the project. IRB approval was not

required for the project due it being deemed non-human research. Interviews were recorded, with consent, and then later transcribed with the use of Rev.com. In addition, interview notes were taken and used during analysis of the interviews. Tracy (2013) writes that “qualitative interviews provide opportunities for mutual discovery, understanding, reflection, and explanation via a path that is organic, adaptive, and oftentimes energizing” (p. 132). The purpose of this research was to allow for introspective data to be gathered and then analyzed by the research to extrapolate information from unstructured interview data.

### *Data Analysis of Part 2*

The analysis began with automated transcription of the interviews which ranged from twelve to thirty-six minutes in length. To allow for multiple analyses throughout the data analysis, constant comparison was utilized. The data was constantly compared to allow for categories to arise from the interview data. The constant comparative method is a “method of analysis used to compare data applicable to each code and to modify code definitions so as to fit new data” (Tracy, 2013, p. 202). This method of data analysis allowed for categories to be created and modified throughout the process. The constant comparative method “is concerned with generating and plausibly suggesting (but not provisionally testing) many categories, properties, and hypotheses about general problems.... [and] unlike analytic induction [other] properties are conditions, consequences, dimensions, types, processes, etc.” (Glaser & Strauss, 1999, p. 104). The constant comparative method does not “attempt...to ascertain either the universality or the proof of suggested causes or other properties” (Glaser & Strauss, 1999, p. 104). The use of the constant comparative method in data analysis allowed for more multiple categories to be identified and modified throughout the process.

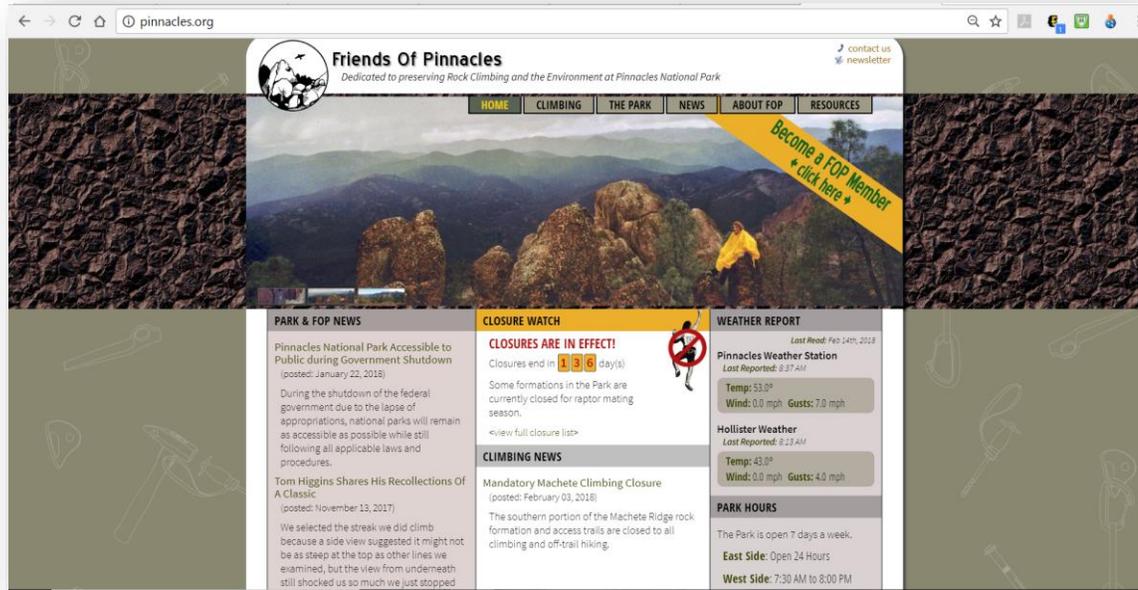
Validity and reliability were addressed throughout the data analysis process. The researcher acknowledged that “The value of scientific research is partially dependent on the ability of individual researchers to demonstrate the credibility of their findings.... [and] strive for authentic work” (LeCompte & Goetz, 1982, p. 31). By utilizing a structured interview procedure with a background in climbing, the researcher was able to include thick description and an understanding of the tacit knowledge included in the interviews.

Reliability in all scientific research “refers to the extent to which studies can be replicated. It requires that a researcher using the same methods can obtain the same results as those of a prior study” (LeCompte & Goetz, 1982, p. 35). To ensure that the research was reliable, the researcher assumed the role of an external research tool in the interview process. The intention was to separate biases from the interview process. The researcher on the project has history as a climber and did not want to skew the data. Therefore, constant self-reflexivity was utilized to check that the interviews and data were not being skewed due to personal motivations. By utilizing self-reflexivity, “the careful consideration of the ways in which researchers’ past experiences, points of view, and roles impact these same researchers’ interactions with, and interpretations of, the

research scene” (Tracy, 2013, p. 2). This conscious separation of values required a careful analysis and checking my personal biases throughout the process.

The use of the constant comparative method also increased reliability as the data were analyzed three separate times and categorized separately each time. This not only increased reliability of the data, but also validity. This method of data analysis also allowed for the categories to be modified and for categories to be added which allowed for categories to evolve throughout the data analysis process.

## APPENDIX F



**Figure 1** Friends of Pinnacles website linked from Pinnacles National Park's website. This provides a great example of a cooperative relationship with a local climbing organization.