Plans for the future: An examination of research methodology and education in parks and protected area visitor use management.

by

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B.A., Canisius College, 2006
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AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Horticulture and Natural Resources
College of Agriculture

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Abstract

Identification, let alone an understanding, of assumptions in the visitor use management (VUM) field are poorly understood and addressed in the literature. While various assumptions – statements or assessments that are not necessarily rooted in factual evidence – that comprise certain outdoor recreation and VUM theoretical frameworks or methods are mentioned, there is a dearth of information on what those assumptions specifically entail and what implications they have. This dissertation offers three separate, yet interconnected, studies which help address this gap in knowledge of how prevalent VUM specific assumptions are and what their implications may be for VUM related research approaches, parks and protected area (PPA) management decisions, and educational influences of future PPA managers. To help address these ideas, this dissertation focuses on three main research questions: One, what research-related assumptions do VUM experts believe are present in the field? Two, how valid is a documented assumption related to the management of PPAs? And three, are any of the assumptions identified from the first research question being promulgated in undergraduate recreation-related classrooms?

To address the first question, a Delphi study was conducted in which 8 VUM experts from around the United States (U.S.) generated a list of 28 research-related assumptions they believe to be present within the VUM field. These assumptions fell into four main categories: methodological, experiential, management-related, and natural resource-related. Through the Delphi process, assumptions were ranked by the expert panelists according to how prevalent, or pervasive, they believed them to be. Through an iterative process, 17 assumptions remained in which the top three from each category were identified. These 17 assumptions represented those that that the panelists agreed were the most pervasive in the VUM field. Specific identification

of these assumptions contributes to the overall efficacy of VUM research approaches, as well as the overall management of PPAs around the U.S..

The second question addresses the PPA manager-visitor and how the preconceived notions and assumptions of managers may impact VUM-related management decisions. The application of VUM strategies and tools has been steadily developing as a discipline to meet the changing recreation needs and behaviors of visitors to many PPAs, yet it is important that these methods and approaches are appropriately evaluated to maintain their efficacy. Manager assumptions and preconceived notions can play into this efficacy. Using data from a previous visitor use study conducted at a U.S. national park, the role of manager assumptions and preconceived notions was investigated, particularly in relation to how PPA managers understand visitor norms, preferences, and needs. During this study, park managers were asked to respond to the same surveys their visitors participated in to anticipate their responses. Overall, results indicated that managers at this particular park were accurate in anticipating visitor responses to certain experiential factors and visitor preferences towards certain management actions and park services. Results from this study have important implications not only for how VUM researchers understand assumptions in the discipline but also how PPA managers approach their decision-making process, particularly those decisions that impact the visitor experience.

To address the third research question, semi-structured interviews were conducted to identify major themes and learning outcomes retained by students in recreation-related majors. Continuing to build on the first chapter, this study investigated whether identified assumptions were being perpetuated in courses that discussed aspects of VUM. This understanding has important implications for how relevant subject material is disseminated in the classroom as well as for how future PPA managers achieve their mission. While results indicated that assumptions

presented in previous research were not being overly perpetuated in the classroom, findings do suggest that there are some potential gaps to be filled and addressed in how recreation-related majors are structured. This study sheds light on how students in this field are being prepared for work as potential PPA managers, as well as how faculty and instructors of such courses approach the subject matter. Ultimately, this dissertation offers insight into, and recommendations for, ensuring best practices are being followed and promoted within the VUM field.

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Approved by:

Major Professor
Dr. Ryan L. Sharp

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presented in previous research were not being overly perpetuated in the classroom, findings do suggest that there are some potential gaps to be filled and addressed in how recreation-related majors are structured. This study sheds light on how students in this field are being prepared for work as potential PPA managers, as well as how faculty and instructors of such courses approach the subject matter. Ultimately, this dissertation offers insight into, and recommendations for, ensuring best practices are being followed and promoted within the VUM field.

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Dedication

For Mary,

In the hopes that your own adventures

and wanderings in the outdoors

provide enjoyment, inspiration, and an

everlasting sense of wonder.

Chapter 1 - Introduction

We all make assumptions on a daily basis. Based on what an individual wears or how they act, we may make assumptions regarding that individual's character. We hear stories or reports about certain places and make assumptions based on those reports, having never visited or seen it ourselves. Looking out the window on any given day, we make assumptions on what the weather will do. Essentially, we formulate preconceived notions about things based on our own thought processes and experiences (Yanchar & Slife, 2004) and, while preconceived notions and assumptions are often used interchangeably, I make the argument that an individual's preconceived notions help *create* assumptions. These preconceived notions may be rooted in personal beliefs and values and are what contribute to the assumptions that we then apply to our daily life or, in the context of this dissertation, one's research. Made throughout history, some assumptions have had profound impacts on how society viewed the world around them, in some cases quite literally.

For example, before Pythagoras suggested the earth was spherical, and before the Greek mathematicians Archytas and Eratosthenes actually conducted experiments to *prove* the Earth was spherical, civilization assumed the world was flat (Dutka, 1993). More recently, assumptions were made about race as a result of the controversial Tuskegee Study in the mid-twentieth century, suggesting that "...African Americans lack enough nitric oxide, a chemical that helps the heart work effortlessly" and therefore have "bad blood" (Reverby, 2010, pgs. 30-31). Just as personal assumptions have the potential to impact social behavior, it is important to also consider how assumptions may influence scholarly research and educational processes. This dissertation sought to investigate such assumptions prevalent in the discipline of visitor-use

management (VUM) in parks and protected areas (PPA) and understand how they impact related research and educational processes.

Visitor-use management research is nothing new, yet given the trending increase in visitation to many of the U.S.'s PPAs in recent years, revisiting the theories, methods, and limitations of VUM research becomes especially important. Furthermore, it can be argued that understanding visitor use in these areas is not so much about the *what* but the *why*. *Why* are we addressing these issues and asking these questions? *Why* do we use the methods that we do? Giving attention to these types of questions may help provide insight into best practices within the context of VUM related research. Here in the United States (U.S.), people have been visiting national parks, and other protected natural areas since their inception. This is unlikely to change anytime soon. However, the needs and recreational demands of those visitors continue to fluctuate (Leung et al, 2018).

Defined as "…the proactive and adaptive process for managing characteristics of visitor use and the natural and managerial setting using a variety of strategies and tools to achieve and maintain desired resource conditions and visitor experiences (IVUMC, 2016)," VUM techniques and strategies can be directly applied to a variety of PPAs and address the many facets that comprise visitor use. These characteristics may include recreation type (Wolf et al, 2018), visitor perceptions, behaviors (Rossi et al, 2015; Roberts et al, 2021) and values (Van Riper & Kyle, 2014), in addition to understanding how visitor use impacts wildlife (Marion et al, 2020) and the natural resource itself (Marion et al, 2016). Approached individually or as interconnected relationships, VUM research and techniques help ensure the continued practicality of natural resource protection along with the appropriate recreational use therein (Cahill et al, 2018). Thus, understanding if "baked in" assumptions that inform VUM research

are impacting the quality of the information provided to managers can be of great importance to the future of PPA management.

It is important to note that while published material on assumptions in VUM and the outdoor recreation-related field is sparse compared to other disciplines, that is not to say it does not exist. D'Antonio & Monz (2016) touch on spatial-temporal assumptions in multiple national parks. Methodological and management assumptions regarding general visitor-use aspects can be found (Manning, 2011) and Hall (2000) specifically makes note of "unquestioned assumptions that have guided policy (pg. 39)." This last reference is perhaps the most relevant to the course of this study, as it directly points out the fact that methodological assumptions often go unchecked. Hall *does* address some of these assumptions related to use limits in wilderness areas, yet does not provide any insight into why such assumptions go unaddressed. Furthermore, despite the focus on wilderness areas, Hall highlights managerial and experiential assumptions which can be applied to a variety of PPA settings, be they wilderness areas, national parks, or even state parks. For example, the assumption related to decreased quality of the visitor experience due to increased use levels. Yet if these wilderness-based assumptions are not undergoing appropriate levels of scrutiny, it is important to understand if and where this lack of testing is occurring in other PPAs.

Recognition, as well as understanding, of long-standing assumptions should also be taken into account in higher education, particularly when we consider the fact that, in any applied discipline concerning PPAs, what students learn in the classroom has implications for their future as potential managers of said areas. This recognition in the education world can be seen both from an instructor standpoint (Watson & Mason, 2007) as well as from a student perspective (Glisczinksi, 2007). The former referring to the transference of assumptions impacting the given

pedagogy, the latter referring to previous assumptions and beliefs of the student being challenged. This challenge of student-held assumptions, and the idea that students should be encouraged to think critically about their own beliefs and attitudes, is a paramount goal of any higher education classroom (Lloyd & Bahr, 2010), or at least should be. However, it is the implications the former has on the educational process of future PPA managers that was another focal point of this study. Additionally, a general recognition of these assumptions from an instructor standpoint is critical. Not to avoid subconsciously perpetuating them but rather to highlight them and generate an awareness of them.

Because of this, three arguments can therefore be raised. One, it is important for PPA managers to promote and encourage research regarding current visitor motivations and preferences for visiting said PPA. Two, it becomes equally important for VUM researchers to evaluate current "best practices" in VUM research methods and theories, as well as any underlying assumptions, in order to ascertain the most relevant and useful visitor data possible. And three, it is important to evaluate the educational process and development of students in recreation-related majors who may go on to become PPA managers. These evaluations are important not only to address the aforementioned changing needs and behaviors of visitors, but also given the recent adoption of the Interagency Visitor Use Management Framework (IVUMF) among all major federal land management agencies in 2016. If the IVUMF is to be the universal approach to VUM in federally-owned public lands for the foreseeable future, it is essential that the elements comprising VUM research and associated techniques of the Framework are critiqued and appropriately evaluated.

While VUM frameworks have existed for decades (e.g. Recreation Opportunity Spectrum (ROS), Limits of Acceptable Change (LAC), Visitor Experience and Resource Protection

(VERP), little to no coordination across land management agencies existed. Even the application of a framework *within* the same agency varied from park to park, as was the case with VERP in several national parks (Fefer at al, 2018). Furthermore, Manning (2011) highlights complications with aspects of these frameworks, such as in determining how much impact should actually be permitted in one area (carrying capacity) and who, or what, actually "determines the limits of acceptable change (pg. 85)?" Other weaknesses of these frameworks, which added to difficulties in their application, included complexity and cost (LAC) or a rigid interpretation of a framework that made it difficult to transcend a variety of environments (ROS; McCool, 2007). Only recently, with the development of the IVUMF (IVUMC, 2016), has a codified, multi-agency wide approach to managing visitors and outdoor recreation impacts been implemented. While this certainly represents a positive step forward in the management of increased visitor use in PPAs around the U.S., it is not to say that this new framework will not face similar challenges of past VUM frameworks (Miller et al, 2017).

Purpose Statement

The purpose of this dissertation is to expand on the understanding of how a variety of assumptions impact VUM research in PPAs as well as how those assumptions may play a role in the education of future managers of PPAs. This research centered around three objectives: One, to uncover underlying assumptions that influence, in one way or another, current VUM research practices. Second, to investigate the implications one such assumption has on current VUM approaches, particularly in relation to how VUM-related assumptions may impact the management decision making process in PPAs. And three, to investigate if and how assumptions

exist in recreation-related degree programs in higher education, and how those assumptions might impact students' careers as future PPA managers.

Structure of this Dissertation

This document follows a three-article dissertation format consisting of three interconnected studies. The following three chapters represent three distinct, yet cohesive studies that fall under the general theme of my research - Assumptions in Visitor Use Management. The fifth chapter represents a summary of findings, potential contributions to the field, and possible recommendations for future VUM considerations.

Chapter Two, entitled Methodological Assumptions in Visitor Use Management Research: The Researcher's Perspective, focuses on gathering information on possible assumptions in VUM research through the use of a Delphi Panel. Highlighting a recognition of methodological assumptions in social science research is nothing new (Weed, 2009), however the goal of this chapter was to uncover potential methodological assumptions within the VUM field, which has not received much attention in the literature. As the very selection of quantitative or qualitative methods may be influenced by these assumptions, with little to no regard from the researcher (Hathaway, 1995), it is important to assess the implications that assumptions in VUM research can have when addressing the multitude of visitor related impacts that exist in PPAs (Graefe et al, 1990). Therefore, I wanted to discover whether or not methodological assumptions existed within the VUM field that could potentially have similar implications. With little to no information regarding such assumptions in VUM literature, this chapter fills a significant gap.

Chapter Three, entitled Thinking Like a Visitor: Parks and Protected Area Managers Judgment of Visitor Perceptions and Norms, centers on investigating how assumptions may impact the PPA manager-visitor relationship. VUM literature states that managers often misjudge the preferences and concerns of their visitors (Farrell et al, 2001), along with the idea that PPA managers will inscribe their own beliefs and values into the decision making process related management actions; actions that are often contrary to the prefernces and needs of their visitors (van Riper & White, 2008). Therefore, this chapter sought to explore the validity of these statements and the implications they have on the role PPA manager perceptions and assumptions of their visitors influence management decisions.

Chapter Four continues to investigate the role assumptions play in the field of VUM, specifically in higher education. Entitled, What Are They Learning and What is Being Taught? Understanding Educational Outcomes and Instructional Influences in Recreation-Related Majors, I wanted to further understand how assumptions may impact the future of PPA managers. Essentially, this study investigated whether or not the aforementioned assumptions are finding their way into the educational processes of recreation-related majors in higher education. Since many students enrolled in a recreation-related degree program often have a specific goal in mind post-college (e.g. park ranger or manager; Henderson, 2009), it becomes crucial that the educational systems in place related to parks, recreation, and tourism management are effectively and adequately preparing the next generation of PPA managers to avoid undue influence of assumptions and issues related to VUM. Appropriate and unbiased perceptions and viewpoints, in addition to purposeful and effective management methods and goals, should be the desired outcomes of any PPA management decision (Ruschkowski et al, 2013). It is therefore important to assess and evaluate the potential of conditioning future PPA managers and avoid the “hidden

curriculum" of educational programs and institutions (Shepard, 2007), which refers to the distinction between what is taught in higher education institutions and what the student actually learns (Jackson, 1968).

Chapter 2 - Methodological assumptions in visitor use management research: The researcher's perspective

Abstract

In an effort to identify and understand inherent assumptions in visitor use management (VUM) research and applications, a Delphi Study was conducted. Recognizing and adequately addressing, and adjusting for, underlying assumptions and preconceived notions are an important aspect of both the approach and methods related to VUM research as well as the management decisions and actions taken, often because of those same research findings. VUM experts from around the United States (U.S.) were recruited to complete a Delphi Study to identify and understand what, if any, assumptions they believe to be present in the VUM field and how prevalent they believe those assumptions to be. The Delphi Study uses a multi-state, iterative approach in order to reach a consensus among participants and apply these results to the intended research objective(s). Twenty-eight assumptions were generated by the panelists, indicating that inherent assumptions are very much present in the discipline of VUM. Top-ranked assumptions were identified in an effort begin a conversation around how these assumptions may impact the VUM research process as well as parks and protected areas (PPA) management decisions and actions. Overall, this study contributes to a growing body of knowledge regarding best practices related to VUM across public lands and other natural areas within the U.S..

Introduction

Visitor-use management (VUM) research, in and of itself, is nothing new, yet given the trending increase in visitation to parks and protected areas (PPA) worldwide in recent years, revisiting the theories, methods, and limitations of VUM research becomes especially important. Furthermore, it can be argued that understanding visitor-use in these areas is not so much about the *what* but the *why*. *Why* are we addressing these issues and asking these questions? *Why* do we use the methods that we do? In the United States (U.S.), people have been visiting national parks, and other protected natural areas, in ever increasing numbers since their inception. This is unlikely to change anytime soon. However, the needs and recreational demands of those visitors (and the associated experiential and resource impacts) continue to fluctuate (Leung et al, 2018). Because of this, two considerations can be raised. One, it is important for PPA managers to promote and encourage research regarding current visitor motivations and preferences for visiting PPA. And two, it becomes equally important for VUM researchers to evaluate current "best practices" in VUM research methods and theories, as well as their underlying assumptions, in order to ascertain the most relevant and useful visitor data possible to ensure sound management actions. These assumptions can be present in a variety of disciplines and situations and occur at any point in the research process. It these assumptions which this study seeks to highlight.

As Burgess-Limerick et al (1994) contend, assumptions can be an inherent part of any research project. In fact, it can be argued that the foundations of research paradigms come with built-in assumptions (Velez, 2008). For the purposes of this dissertation, any mention of assumptions refers to statements or assertations that are not necessarily rooted in factual evidence or, what Hagger & Chatzisarantis (2009) refer to as, "over-generalisations" that may be

"unfounded" (p. 512). Overall, investigations into theoretical and methodological assumptions tend to be more prevalent in other disciplines than in the VUM and related outdoor recreation field. Indeed, scholarly literature is rich with examinations into the role of assumptions in a variety of fields. The aforementioned look into historical assumptions and their role on modern perspectives is apparent (Currie, 1980; Hirsch, 1980; Jonakait, 2005; Rotenstreich, 1971) and underscores the need for a continued understanding of how these assumptions fit into, specifically, VUM research.

Therefore, this study seeks to answer the following questions:

1. What, if any, assumptions exist in VUM research?

and,

2. What are the implications of these assumptions for broader VUM techniques?

Literature Review

As a broad concept, the study of outdoor recreation and its implications did not garner much attention until after World War II (Manning, 2011). Indeed, the existing pool of literature related to outdoor recreation was considered "meager" even into the 1950's (Wolfe, 1964, p. 203). But by the late 1950's, and through the subsequent decades, more and more attention has been given to the research and understanding of outdoor recreation trends and impacts. This was fueled in large part by the creation of the Outdoor Recreation Resource Review Commission (ORRRC) in 1958, which is often credited with cementing recreation as a critical component in the creation of multiple use mandates, as well as making recreation a permanent fixture in resource management planning policy (Olson, 2010).

As the focus on outdoor recreation and its associated management concerns grew, so too did the outpouring of terminology and focus areas related to outdoor recreation management. Studies in recreation and recreation ecology grew in the 1960's (Monz et al, 2013). Once it was signed into law in 1964, The Wilderness Act brought the concept of wilderness management, and the preservation of wild and pristine natural settings to light (Hendee et al, 1978). Even legislation such as the National Environmental Policy Act (NEPA) of 1969, largely considered to be one of the most significant pieces of environmental legislation in U.S. history, had profound impacts on the relationship between humans and the natural environment (Buckley & Warnken, 1998). And while NEPA provides regulatory measurements for managing PPAs, historically there has not been a common approach to management goals (Cerveny et al, 2011), particularly when it came to agencies managing the visitors themselves and their recreational habits and impacts. Academic institutions saw growth of their parks and recreation, leisure sciences, and tourism programs. North Carolina State University's Parks, Recreation, and Tourism Management department became nationally accredited in 1977, the first of its kind to be given that distinction. And now, research concerning visitor use studies, visitor impacts in PPAs, and visitor behavior and expectations abound in the literature (Manning, 2011). Even the phrase 'visitor use management' has become the de facto term for what Eagles (2001) claims to be one of the keys to "the successful protection of the ecological, social, economic and cultural values" of PPAs (p. 67).

Theoretical, as well as applied, approaches to VUM studies and associated recreation behavior displayed similar evolution over the years since ORRRC's inception. Early social science research approaches to visitor studies focused heavily on descriptives and lacked any real theoretical foundation (Manning, 2011). However today, there are dozens of theoretical

approaches that social science researchers can pull from to approach a variety of environmental issues: Social Norm Theory (Stern, 2018); Cognitive Dissonance (Balcetis & Dunning, 2007); Theory of Planned Behavior (Curtis et al, 2011); Cultural Cognition (Kahan & Braman, 2006); and Collective Impact (Hanleybrown et al, 2012), to name just a few. These theories focus on influencing behavior, behavior inconsistent with personal values, attitudes influencing behavior, the influence of pre-existing beliefs, and the importance of a common agenda among stakeholders, respectively (Stern, 2018). Furthermore, the application of VUM research methods such as GPS Visitor Tracking (GVT; Beeco et al, 2014), photographic panels (Cribbs et al, 2019), surveys (Wolf et al, 2012), trail counters (D'Antonio & Monz, 2016), and even the use of social media (Miller et al, 2019) and wildlife utilization distribution (Nettles et al, 2021), underscores the growing utility of these methods in understanding outdoor recreation behavior and improving the efficacy of VUM research in PPAs.

Very little can be found in the way of assumptions in VUM literature. Even less frequent, is any mention of addressing those assumptions. Beeco et al. (2013) do make some mention of methodological assumptions in their study of the relationship between visitor use and landscape impacts. Cahill et al. (2018) point to underlying assumptions that may impact the validity of a study based on the dynamic nature of visitor use and recreation behavior and Hall's 2000 wilderness study specifically makes note of "unquestioned assumptions" (pg. 39)." And while Hall addresses some of the assumptions related to wilderness use limits, nothing of the *why* such assumptions go unaddressed is referenced. Despite being mentioned almost as an afterthought, these examples point to a broader issue of how to actually address those assumptions, whether that is in the research methods themselves or elsewhere.

Highlighting a recognition of methodological assumptions related to research in the social sciences is nothing new (Weed, 2009). Furthermore, the very selection of quantitative or qualitative methods may be influenced by certain assumptions, with little to no regard from the researcher (Hathaway, 1995). These assumptions can influence the development and direction of the research itself in a variety of ways (Hagger & Chatzisarantis, 2009) and it is important to assess the implications that assumptions in VUM research can have when addressing the multitude of visitor-related impacts in PPAs (Figure 2.1).

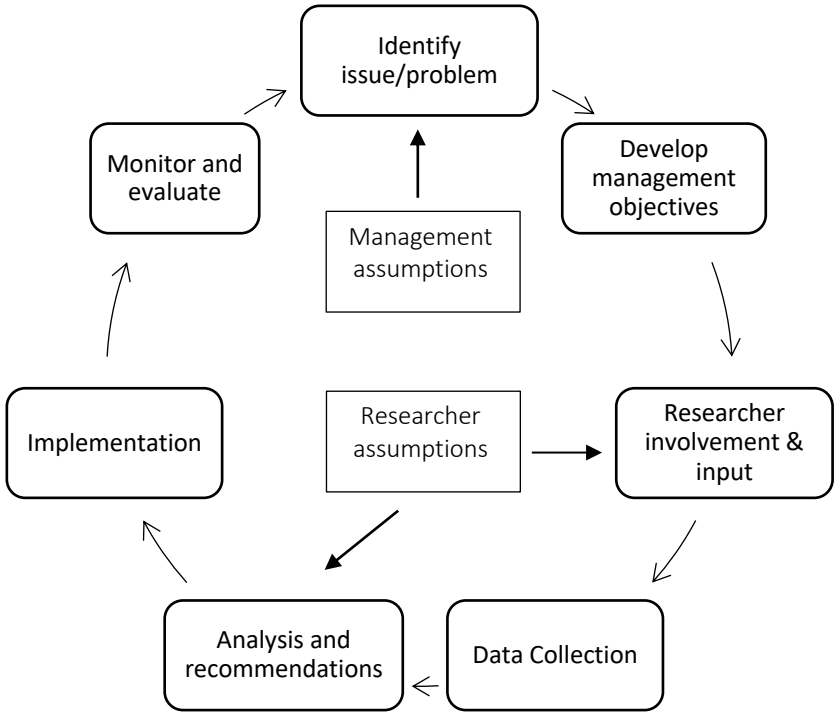

Figure 2.1 Basic conceptual framework illustrating how both manager and researcher assumptions might influence visitor-use management research. Perceived assumptions about a problem may influence management objectives, while research assumptions may influence methods and management recommendations

These implications may carry even greater weight with the recent adoption of the Interagency Visitor Use Management Framework (IVUMF; IVUMC, 2016). Developed by the

Interagency Visitor Use Management Council (IVUMC) in 2016, the IVUMF serves as a guide for managing visitor use on all federally managed land in the U.S. (IVUMC, 2016). While the IVUMF does not represent a necessarily new approach in the sense that its methods are unique or original, in fact many parts of it incorporate ideas and methods of past frameworks such as Limits of Acceptable Change (LAC) and Visitor Experience and Resource Protection (VERP), it does provide a framework that can be universally adapted and integrated into existing management planning and decision-making processes. Indicators and thresholds, for example, have been used for many years as an informative and defensible way for managers and researchers to monitor visitor use impacts (Manning, 2011). However, the fact that the methodological process of implementing indicators and thresholds across all federally owned lands and waters has now been applied speaks to the importance of evaluating the efficacy and longevity of these processes. If the IVUMF represents the foundation of VUM planning, and research for federal lands in the U.S. for the foreseeable future, it is critical that we evaluate how effective the metrics used are. In other words, how much do the aforementioned assumptions impact current and future VUM research methods and how may this be impacting the management of protected areas? With this in mind, this study seeks to identify inherent assumptions that are present in VUM research.

Methodology

The Delphi technique was employed due its efficacy in facilitating the generation of knowledge among VUM experts from around the U.S. as well as its ability for consensus building (Vallor et al, 2016). It's ability to reach and contact panel members regardless of their location (particularly during the global COVID-19 pandemic when face-to-face interaction was

limited) made this approach advantageous for this study and allowed for the positive and effective interaction between the researchers and panel members throughout the duration of the study. The goal was to gather expert knowledge and information regarding assumptions in VUM research and work towards consensus among panel members regarding those assumptions.

Delphi Technique

The Delphi technique is a multistage approach, using successive rounds of surveys or questionnaires "to obtain the most reliable consensus of opinion" from said experts (Dalkey & Helmer, 1963; 458). This consensus is then applied to the intended research objective(s). This approach can be used in forecasting, as well as to "explore and understand" a phenomenon (Vallor et al, 2016, pg. 5). As previously stated, this method uses a successive series of questions which build upon the results of the previous round (Figure 2.2). In this way, it is iterative in nature. Throughout these rounds experts of the appropriate discipline contribute to, and comment on, a growing body of information related to the research objective(s) (Vallor et al, 2016). The literature varies on how many rounds are appropriate and is most often determined by the scope and nature of the research itself (Kaynak et al, 1994). However, three iterations of questions are usually enough to reach consensus (Custer et al, 1999; Hsu & Sandford, 2007).

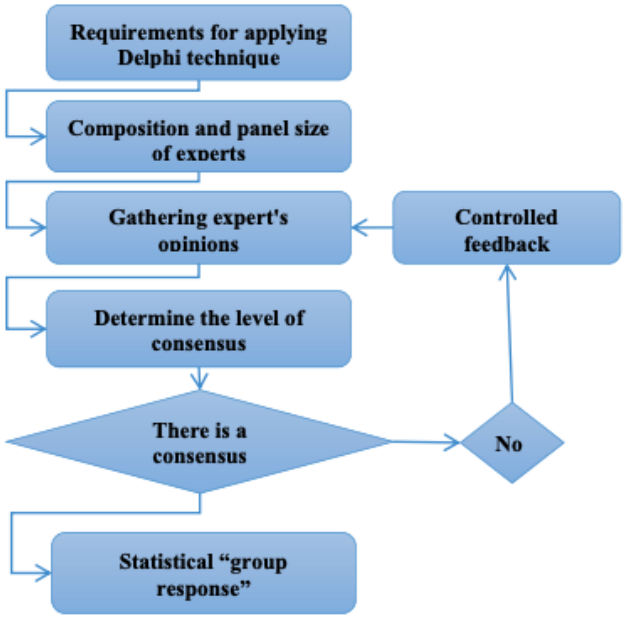

Figure 2.2 Theoretical framework for Delphi Technique (Habibi et al, 2014)

Selection of panel experts is done by the researcher, often with input from others who are invested in the study (e.g. doctoral committee or collaborating researchers). It should be noted that an important characteristic of this approach is one of anonymity (Yousuf, 2007). Despite having a "group" of individuals participating, only the moderator (i.e. researcher) knows the identity of those involved and the individual identities of each participant is unknown to the other members of the panel.

Advantages of the Delphi Technique

The following advantages make the Delphi technique particularly attractive for the type of research being conducted in this study:

1. Anonymity - Anonymity between participants goes beyond ethical and privacy considerations. In keeping participants unknown to each other, it also avoids problems of group-bias or group-think (Murray & Hammons, 1995). Similarly, anonymity has the

added advantage of negating any one 'voice' being louder than the other. In other words, it removes the possibility of a dominating individual which might occur in another group setting (Hsu & Sandford, 2007).

2. Simplicity - The Delphi technique is, in its most basic form, simple to employ. It does not require advanced statistical or mathematical skills to develop and implement and in fact, its difficulty is really only dependent on the researcher themself and the level of complexity they wish to employ (Yousuf, 2007).
3. Coordination - Typically carried out via electronic methods, this technique allows for the generation of data from a group of individuals carried out at times most convenient for the individual (Ruschkowski et al, 2013). Instead of having to coordinate a single time for all participants to gather, said participants can, within reason, complete each round at their leisure.

Disadvantages of the Delphi Technique

1. Unrepresentative sample - As the technique gathers information from a (typically) smaller group of experts, some have made the argument that it does not accurately represent the general population of that discipline (Yousuf, 2007).
2. Low Response Rate - Because of the iterative nature of the technique, and the requirement for involvement in successive rounds, participant burnout can be common, therefore resulting in lower response rates (Hsu & Sandford, 2007).
3. Nonuniformity - Critics have stated that a major weakness of this technique is its lack of a theoretical framework underpinning the entire validity of its approach. Despite being presented in a variety of ways (e.g. survey, procedure, method, approach), some have

claimed that overall, the methodology of the Delphi technique lacks uniformity and consistency (Habibi et al, 2014).

Despite these disadvantages, the advantages of the Delphi approach far outweigh the potential limitations. Overall, between the iterative feedback from a panel of experts and the ability of this technique to fluidly and objectively explore issues requiring judgement (Gordon, 1994) makes the Delphi technique a suitable approach to this study.

This Delphi study consisted of three rounds. Data was gathered from expert panel members and analyzed. Responses were reformatted and redistributed to panel members in subsequent rounds (Dalkey & Helmer, 1963; Ruschkowski et al, 2013; Fefer et al, 2013; Vallor et al, 2016). All forms and letters were reviewed by the Kansas State University Institutional Review Board (Proposal Number 10068; Exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: 2, subsection: ii**).

Qualtrics survey software (Qualtrics, Provo, UT) was used to design and distribute questionnaires. The use of Qualtrics allowed participating panel experts simple access to questions via a secure link as well sophisticated, real-time analysis of results. These features in the Qualtrics platform allowed for efficient turnaround of data to redistribute to panel members. While reminders to complete rounds were needed and added to the length of the study, collection and generation of data through Qualtrics greatly helped maintain a reasonable timeframe for the entire Delphi study. The first round of questions was distributed on March 16, 2020, with a stated time frame of two weeks to complete the questionnaire. A second request for participation was sent out, extending completion of the first round another week. The second round of

questions was sent out April 20, 2020, also with the request to complete the questions in two weeks. Two reminders to complete this round were sent. The third and final round of questions was sent on May 31, 2020, again with a stated time frame of two weeks. One reminder to complete this round was sent. Final responses were collected on June 24, 2020 resulting in a total data collection period of approximately 14 weeks.

Lastly, the use of Qualtrics maintained the aforementioned anonymity among panel members. Throughout the study, only the research team was aware of the participants' identities and only the lead researcher had access to the Qualtrics login (Fefer et al, 2016).

Participant Selection and Response Rate

The classical Delphi study uses a panel of experts in a given field (in this case, VUM) which provide a diverse background of experiences and knowledge, as well as offers logistical advantages such as time, cost, and not having to meet every individual face-to-face (McKenna, 1993). Furthermore, the anonymity between participants has the added advantage of negating problems of group-bias or group-think (Murray & Hammons, 1995).

Participant selection was done using specific criteria including, (1) being involved, or having been involved, with VUM research and topics from an academic standpoint, (2) a record of published VUM research articles and/or VUM-related work accomplished, and (3) has had, or currently has, a record of teaching classes incorporating aspects of VUM. Furthermore, participant selection was based on ranges of career length as a recreation-related program faculty and researcher and divided as follows: entry-level (0-5 years), mid-level (6-15 years), and senior (16 years – retired). These divisions were made in an effort to shed light on the prevalence of

uncovered assumptions based on years of experience as it may be that assumptions change over time or based on experience.

The size of the panel in a Delphi study can vary, with the final number reliant on the nature and breadth of the study (Kaynak et al, 1994). Malterud et al (2015) state that the number of participants to contact for a study can be generated by considering the following: the aim of the research itself (detailed or broad); experience of sample (specific or not); theoretical foundation; strength of dialogue (strong or weak) among sample; and the type of analysis used. Of the 13 individuals contacted, one no longer considered themselves to be experts in the VUM field, despite a past history of VUM research. Three individuals did not respond to the invitations to participate and one missed the deadline to complete the first round of questions and responded only after the first round of data collection and analysis had been completed. This left eight VUM experts that completed the first round. Of these eight panelists, four were entry-level, three were mid-level, and one was senior. Response rate for the second round was 100%, with all eight of the initial participants completing the second round of questions as well. The final round saw an 88% response rate, with only one panel expert who had completed the first two rounds failing to complete the final round of questions. Table 1 shows the number of participants in each round of the Delphi study. Overall, the majority of provisions suggested by Malterud et al (2015) were met, as this study focused on a precise topic, participants were very educated in the specific discipline being addressed, and the nature of the Delphi study promoted dialogue between participants as well as allowed for effective analysis.

Table 2.1 Number of participants in three rounds of the Delphi Study.

Round	Sent	Received	Response Rate
One	13	8	62%

Two	8	8	100%
Three	8	7	88%

While the initial response rate was lower than expected, overall response rates were consistent with similar Delphi studies (Kaynak et al, 1994; Ruschkowski et al, 2013; Vallor et al, 2016). Additionally, the response rates for the second and third rounds indicated a commitment to see the study through to its completion from those panel members who completed the first round and second rounds.

Delphi Round One

The first round of this process focused on two things; evaluating the panel's level of involvement in VUM research and identifying any assumptions that the panel believe to exist in VUM research practices. Qualifying questions for the study included:

- Have you been involved with VUM research at any point during your career? Y/N
    - If Yes, for how long?
- Are you currently involved with VUM research? Y/N

Participants were also asked if their research methods included and/or considered current management frameworks such as the Recreation Opportunity Spectrum (ROS), Visitor Experience and Resource Protection (VERP), Limits of Acceptable Change (LAC), and the Interagency Visitor Use Management Framework (IVUMF). By answering this question, insight into the scope of the participants' experience with VUM-related frameworks was given. Furthermore, in the case of the IVUMF, this questioned highlighted those who were/are actively engaged with the most current PPA management practices across federally-managed public land in the U.S.

Participants were also asked whether or not they believe inherent assumptions are built into VUM research methods and applications. If yes, they were provided the opportunity to explain what those assumptions are. All responses were entered, anonymously, into the Qualtrics Survey Software as open-ended responses. No limit was placed on the number of assumptions participants could include in their response. At this stage in the Delphi process, participants could not see each other's responses. Table 2.2 highlights examples of some of the assumptions that came out of Round One of this Delphi study.

Table 2.2 Examples of participant responses - Assumptions present in visitor use management research

Response created by participant 007 on March 17, 2020
Higher use levels are undesirable. Urban parks are always a stepping stone to more rural experiences, instead of an end-goal destination in their own right. There's a clear delineation of preferences and user groups between front and back country conditions. Visitors prefer the least impacted landscapes. The designation and/or management agency of a PPA matters to visitors. Desired future conditions should mimic a single historic point in time.
Response created by participant 005 on March 24, 2020
There is a strong relationship between amount of visitor use and crowding/conflict. There is a strong relationship between amount of visitor use and resource impact. Visitors are willing to accept limits on recreation use to achieve higher quality recreation opportunities.

At the conclusion of Round One, 28 assumptions were identified by the eight participants. These assumptions were grouped into four categories: 1) management related assumptions, 2) experiential assumptions, 3) resource related assumptions, and 4) methodological assumptions. Descriptive validity was maintained by keeping the original

wording and intent of responses (Vallor et al, 2016). Where appropriate, overlapping concepts were combined to minimize repetitive and/or similar assumptions.

Participant demographic and background information was also included in this first round which included:

- Are you: Male Female
- What is your age?
- Current position/title.
- Did you, or are you currently, teaching courses that discuss VUM issues and or/specific management frameworks? Y/N
    - If Yes, what is the name of the course and what do you incorporate/teach about?

This last question had implications for how assumptions fit into the role of educational practices in VUM and outdoor recreation related majors in higher education and will be addressed in Chapter 4.

Delphi Round Two

Round Two of this process introduced participants to the results from Round One and sought to begin narrowing down assumptions that participants believed to be the most prevalent in VUM related research. All responses from Round One remained anonymous among survey participants. This round was also the first step in reaching a consensus among the panel of experts. Using the Sum Total Matrix Table option in Qualtrics, participants were asked to examine the assumptions from Round One that were separated into categories and allocate points to each based on how prevalent they are in VUM related research and practices. In other words, participants were asked to rank the assumptions based on the level of which they believe the

assumptions impact VUM research practices. Using a constant sum matrix table in Qualtrics, participants were asked to allocate a total of 100 points across each category of assumptions. In other words, participants could allocate anywhere from 0 to 100 points to each assumption, with the total number of points allocated totaling 100.

Additionally, since participants were now able to view responses from other panel members, they were asked to provide comments on those responses. Along with commenting on others responses, this also provided participants an opportunity to comment on and/or clarify their own statements. The goal of providing an opportunity for open-ended responses was to help generate a deeper understanding of the assumptions, as well as provide a more robust interpretation of what these assumptions mean. Table 2.3 provides an example of comments made in response to one such assumption.

Table 2.3 Example of participants' comments in response to panel generated assumptions.

Assumption: Visitor Capacity Will Solve All Our VUM Challenges (Management Related Assumption)
Comment: Visitor capacity is one part of a larger solution.
Comment: Visitor capacity has dominated our literature, and I believe this is presumed to be a solution to many issues protected area managers are facing.

At the conclusion of Round Two, mean scores were calculated based on the total sums and assumptions were ranked from least to most evident in the eyes of the panel.

The mean, standard deviation, and range was calculated for each assumption. Inclusion criteria for Round Three included those assumptions that had a mean score of *at least* 10 (based

on participants 100-point rankings) OR had a maximum point value of at least 35 assigned to it by any participant AND where participant comments placed particular emphasis on the assumption. In other words, assumptions with lower mean values were still chosen for Round Three if a significant number of points were allocated to that assumption as well as participant comments stressing its importance. Exclusion of assumptions was also based on those assumptions with low mean values as well as low standard deviations. Low standard deviations, coupled with low mean values, implies agreement among participants that these assumptions are not as prevalent. As a result, 17 assumptions were obtained from Round Two to be included in Round Three, divided among the categories in the following manner: five out of seven original management assumptions, five out of twelve original experiential assumptions, two out of four original resource-related assumptions, and five out of five original methodological assumptions

Delphi Round Three

The remaining seventeen assumptions were again distributed to participants by way of a Sum Total Matrix Table in Qualtrics. Working to achieve consensus, respondents were asked to again rank the assumptions in the order which they believe them to be more prevalent in VUM research. Additionally, participants were asked to respond to, and share their own thoughts on, the assumptions and new comments made by other members of the panel. This provided continued depth and context regarding the assumptions brought forward by the panel. Examples of final comments made by panelists are highlighted in Table 4.

Table 2.4 Examples of final comments on assumptions made by respondents.

Comment made by participant 002 on June 9, 2020

I don't think any of the others' comments on this section added to or changed my thinking. I stand by my original comment about the resource dichotomy being the most pervasive assumption and one that limits or preordains how we discuss use-impact relationships. I wonder if some of this is because we are such an applied science and management of parks typically have natural and cultural resources as separate divisions/branches. Parks are human landscapes and as such, resource delineations aren't neat and tidy.

Comment made by participant 007 on June 24, 2020

All of the assumptions above are hugely influential - much more so than some of the previous sets, in my opinion.

At the conclusion of Round Three, descriptive statistics were calculated, and assumptions were again ranked based on mean scores, resulting in a consensus among respondents regarding top-rated assumptions.

Limitations

This study began as the onset of the global COVID-19 pandemic effects took place in the U.S. Requests for participation were sent out as institutions and faculty throughout higher education were scrambling to implement new teaching and research protocols as campuses across the U.S. shut down. As a result, limitations were present, not least of all the possibility that priority may not have been given to this study due to the unique circumstances.

It should be pointed out that after the second round, one participant did comment on the fact that two of the generated assumptions presented were essentially stating the same thing regarding use levels and associated impacts. While efforts to minimize repetitive and/or similar assumptions were made, this one did slip through the editing process. That being said, I am confident that, based on the resulting rankings, this did not impact the integrity of the data as both assumptions retained the top spot throughout the Delphi rounds.

Lastly, fewer comments were made after the final round of the Delphi process, which could be attributed to a number of factors including the timing of request for participation and difficulty in spending considerable time and thought on the study, and possibly even continued complications related to the ongoing COVID-19 pandemic.

Results

The primary goal of this research was to reveal prevalent assumptions in VUM research, generated by VUM experts in the U.S. Twenty-eight assumptions were produced from a panel of eight participants. These eight participants were from an initial request for participation of 13 VUM experts in academic research positions around the U.S., resulting in an initial panel response rate of 62%.

Delphi Round One: Participant Information and Assumptions

The first round of the Delphi process focused on inclusion criteria and the identification of assumptions. On average, participants have been involved with VUM research, as either a project coordinator or primary investigator, for 13.2 years with a maximum involvement of 21 years (Figure 2.3). The minimum years of involvement was six years, which highlights the span of experience in the field as well as highlights said involvement in the development of assumptions. Seven out of eight respondents (88%) were still involved in VUM research at the time of data collection, with only one not currently conducting research. Respondents were split 50/50 male and female, with a median age of 41 years.

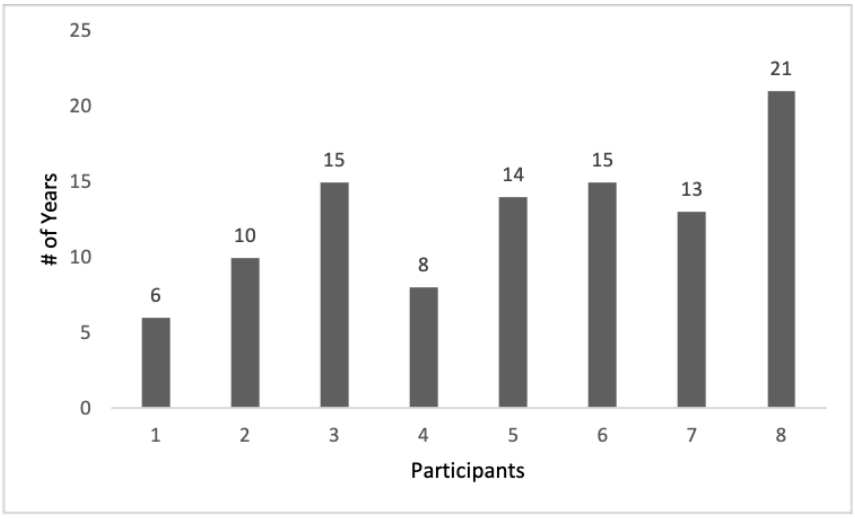

Figure 2.3 Participant years of involvement in the VUM field.

At the time of data collection 63% of respondents were Assistant Professors and were currently teaching, or had previously taught, classes related to VUM (Figure 2.4).

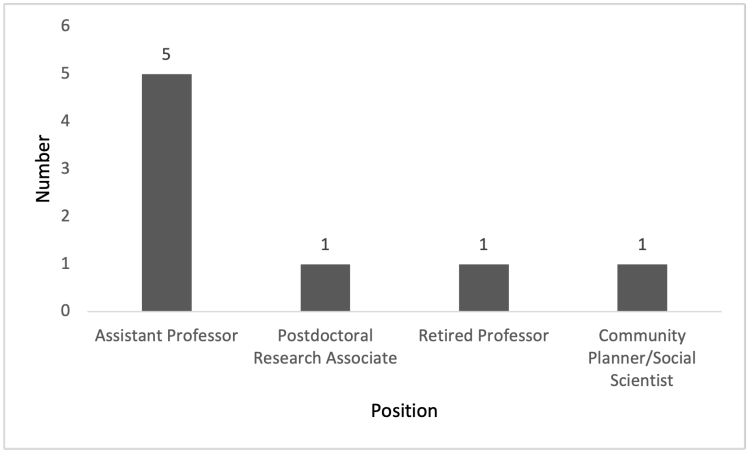

Figure 2.4 Position of respondents at time of data collection. All have taught, or currently teach, in higher education in an outdoor recreation-related major.

In an effort to gain insight into individual research practices among respondents, participants were asked what, if any, management frameworks they incorporated into their research, either currently or at some point in the past. Of those frameworks, the IVUMF, VERP, and the ROS were the top three mentioned. Others included Visitor Impact Monitoring (VIM), Carrying Capacity Assessment Process (C-CAP), and LAC were also mentioned (Figure 2.5).

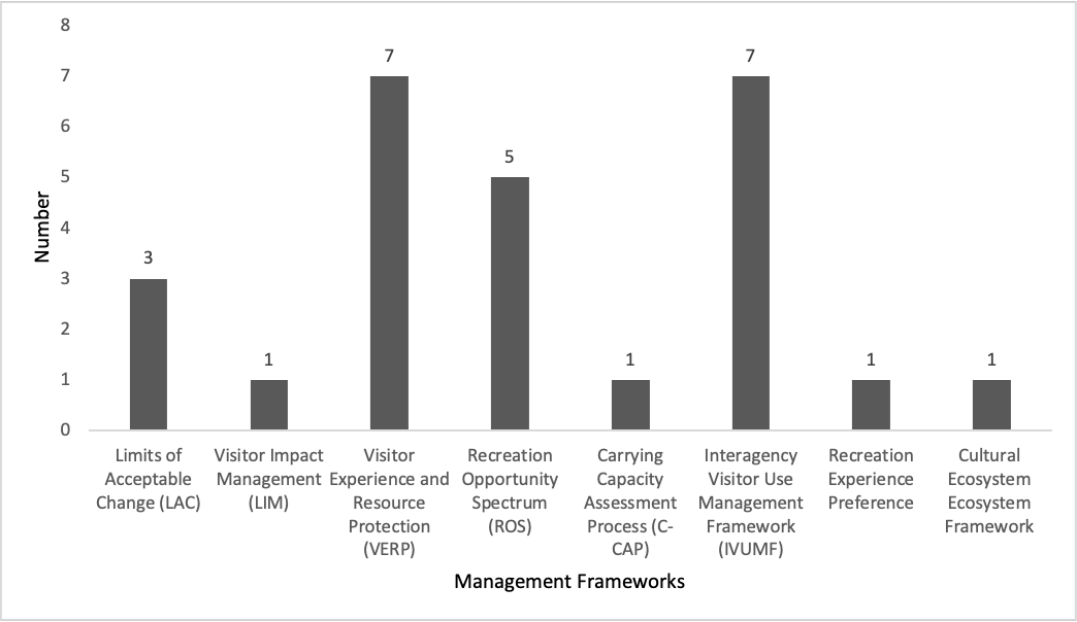

Figure 2.5 Management frameworks incorporated into participant research.

Participants were also asked about specific research tools and methods incorporated into their work. Possible options included qualitative and/or quantitative surveys, photo panels, trail counters and human behavior cameras. Participants could also provide their own response if other methods were used. Surveys, both qualitative and quantitative, topped the list (100%), with photo panels and trail counters being the second most used methods (88%) by respondents. Other methods used included visitor observation, visitor employed photography/videography,

Public Participation Geographic Information System (PPGIS), interviews, and social groups, among others (Figure 2.6).

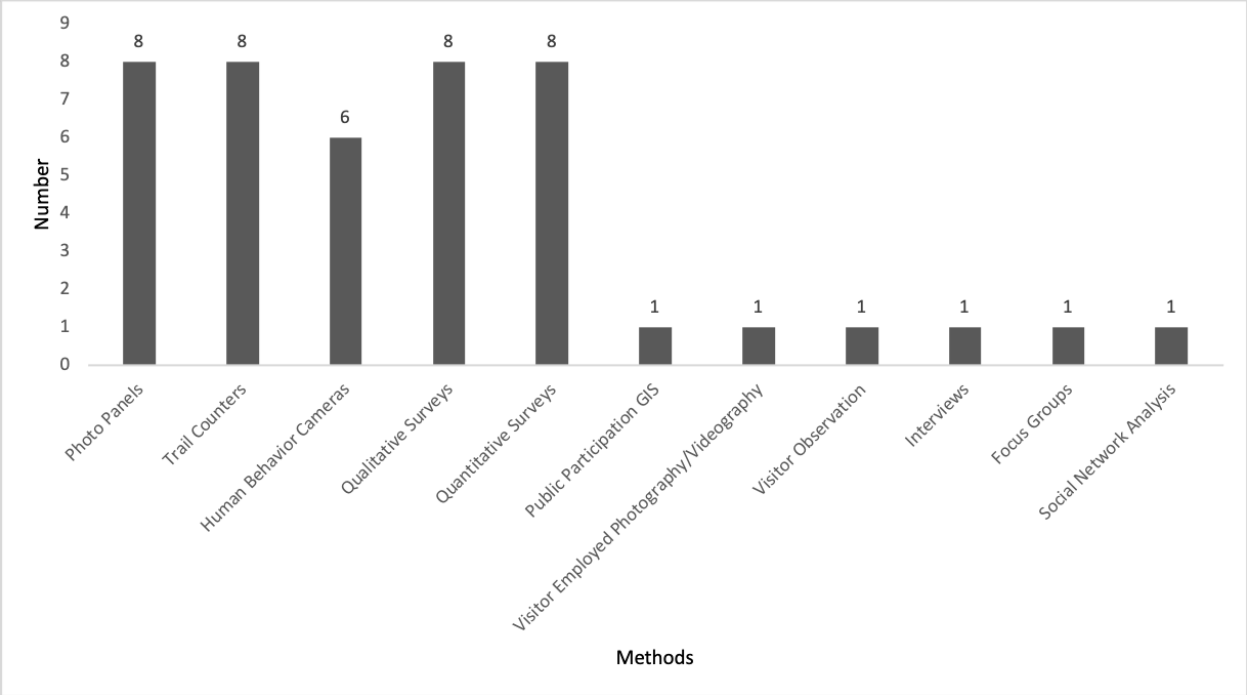

Figure 2.6 Primary methods used by respondents for VUM related research.

When asked if they believe assumptions are built into VUM research, 100% of respondents stated that yes, assumptions are inherently part of VUM and associated research. Respondents were then asked to share those assumptions. Table 2.5 illustrates the 28 assumptions initially identified by the panel and reformatted for subsequent Delphi rounds.

Table 2.5 Panel generated assumptions in VUM research.

Assumptions
Research influences management decisions.

Parks and protected area managers are different from visitors.

Increasing diversity in park use is desirous [*sic*] and won't change management priorities.
Visitor capacity will solve all our VUM problems.

Urban parks are a stepping stone to more rural experiences, rather than an end goal in their own right.

Designation and/or managing agency of a PPA matter to visitors.

Desired future conditions should mimic a single historic point in time.

Visitors act in a rational manner that follows the Recreation Demand Hierarchy.

Visitor perceptions are formed around cognitive hierarchy.

Visitors are motivated to achieve desired outcomes from a recreational experience while protecting the environment at the same time.

There is a strong relationship between the amount of visitor use, crowding, and conflict.

Visitors are willing to accept limits on recreation use to achieve higher quality recreation opportunities.

Crowdedness contributes to a low quality experience and displacement.

Displacement due to crowding is bad.

Visitor crowding and density are the same thing.

Higher use levels are undesirable.

Delineation of preferences and user groups between front and backcountry conditions.

Visitors prefer the least impacted landscapes.

Visitors can perceive and evaluate resource impacts (social or ecological).

A dichotomy exists between natural and cultural resources.

Strong relationship between amount of visitor use and resource impact.

Visitor density contributes to wildlife displacement.

There is a clear relationship between use levels and associated impacts.

Research is influenced by visitors not local communities.

Data with low response rates represent patterns.

Indicators and thresholds measure social norms.

Behavioral intentions measure actual behavior.

Visitor spatial-temporal behavior is driven by factors we can measure in VUM in predictable ways.

From this list, themes were extracted and categorized into four groups applicable to the VUM field: methodological assumptions, experiential assumptions, resource related assumptions, and management related assumptions. Table 2.6 highlights this breakdown. Respondents in the subsequent round were then asked to view this breakdown and rank each assumption.

Table 2.6 Categorization of panel generated assumptions.

Methodological Assumptions
Research is influenced by visitors not local communities.
Data with low response rates represent patterns.
Indicators and thresholds measure social norms.
Behavioral intentions measure actual behavior.
Visitor spatial-temporal behavior is driven by factors we can measure in VUM in predictable ways.
Experiential Assumptions
Visitors act in a rational manner that follows the Recreation Demand Hierarchy.
Visitor perceptions are formed around cognitive hierarchy.

Visitors are motivated to achieve desired outcomes from a recreational experience while protecting the environment at the same time.

There is a strong relationship between the amount of visitor use, crowding, and conflict.

Visitors are willing to accept limits on recreation use to achieve higher quality recreation opportunities.

Crowdedness contributes to a low quality experience and displacement.

Displacement due to crowding is bad.

Visitor crowding and density are the same thing.

Higher use levels are undesirable.

Delineation of preferences and user groups between front and backcountry conditions.

Visitors prefer the least impacted landscapes.

Visitors can perceive and evaluate resource impacts (social or ecological).

Resource Related Assumptions

A dichotomy exists between natural and cultural resources.

Strong relationship between amount of visitor use and resource impact.

Visitor density contributes to wildlife displacement.

There is a clear relationship between use levels and associated impacts.

Management Related Assumptions

Research influences management decisions.

Parks and protected area managers are different from visitors.

Increasing diversity in park use is desirous [*sic*] and won't change management priorities.

Visitor capacity will solve all our VUM problems.

Urban parks are a stepping stone to more rural experiences, rather than an end goal in their own right.

Designation and/or managing agency of a PPA matter to visitors.

Desired future conditions should mimic a single historic point in time.

Delphi Round Two: First Ranking of Assumptions and Comments

Response rate for the second round was 100%, with all eight participants who completed the first round also completing the second round. The focus of this round centered around the aforementioned assumptions and the ranking of those assumptions among the panelists. Furthermore, panelists were asked to comment on the assumptions as this was the first time they were viewing responses from other panel members.

Methodological Assumptions

The assumption that "indicators and thresholds measure social norms" was the top-rated assumption (m=31.88) generated by the panel. This was followed by "visitor spatial-temporal behavior is driven by factors we can measure in VUM in predictable ways" (m=25.00) and "behavioral intentions measure actual behavior" (m=21.25). Perhaps no less important, the remaining responses generated highlight the variety of assumptions that VUM experts believe play a role (Table 2.7).

Table 2.7 Panel rankings of methodological assumptions after being categorized from full list of generated assumptions.

Assumption	Min	Max	Mean	Std Dev
Indicators and thresholds measure social norms.	20	50	31.88	11.16
Visitor spatial-temporal behavior is driven by factors we can measure in VUM in predictable ways.	0	80	25.00	24.49

Behavioral intentions measures actual behavior.	0	50	21.25	15.56
Research is influenced by visitors not local communities.	0	30	12.86	10.30
Data with low response rates represent patterns.	0	35	10.63	13.10

**mean values are based on individual allocation of 100 points within each category.*

Experiential Assumptions

"Visitors are motivated to achieve desired outcomes from a recreational experience while protecting the environment at the same time" was the top-rated assumption in this category, with a mean score of 17.5. This was followed by the generated assumption that "visitor perceptions are formed around cognitive hierarchy" (m=13.63) and the assumption that "visitors can perceive and evaluate resource impacts (social or ecological)" (m=10.63). Other top rated assumptions focused on aspects of visitors following the Recreation Demand Hierarchy, the assumption that there is a strong relationship between the amount of visitor use, crowding, and conflict and the assumption that crowdedness contributes to more negative experiences as well as leads to displacement (Table 2.8).

Table 2.8 Panel rankings of experiential assumptions after being categorized from full list of generated assumptions.

Assumption	Min	Max	Mean	Std Dev
Visitors are motivated to achieve desired outcomes from a recreational experience while protecting the environment at the same time.	0	30	17.50	9.35
Visitor perceptions are formed around cognitive hierarchy.	0	35	13.63	14.39
Visitors can perceive and evaluate resource impacts (both social or ecological).	0	45	10.63	14.24

There is a strong relationship between the amount of visitor use, crowding, and conflict.	0	30	10.50	10.81
Visitors act in a rational manner that follow the Recreation Demand Hierarchy.	0	35	10.38	12.39
Crowdedness contributes to a low quality experience and displacement.	0	20	8.75	8.20
Higher use levels are undesirable.	0	20	7.88	8.46
Visitors are willing to accept limits on recreation use to achieve higher quality recreation opportunities.		20	6.63	6.96
Delineation of preferences and user groups between front and backcountry conditions.	0	20	4.38	6.34
Visitors prefer the least impacted landscapes.	0	10	4.13	3.59
Displacement due to crowding is bad.	0	10	3.75	4.84
Visitor crowding and density are the same thing.	0	10	1.88	3.48

**mean values are based on individual allocation of 100 points within each category.*

Resource Related Assumptions

Results from this first round of ranking resulted in the assumption that "there is a clear relationship between use levels and associated impacts" being the highest ranked among panelists (m=32.5). Closely followed were the assumptions that there is a "strong relationship between amount of visitor use and resource impact" and that "a dichotomy exists between natural and cultural resources." These resulted in mean scores of 30.63 and 28.13, respectively (Table 2.9). It should be noted that the two top-ranking assumptions related to use levels and resource impacts are essentially the same thing and something that was missed during the initial categorization process, something that was commented on by one of the respondents.

Table 2.9 Panel rankings of resource related assumptions after being categorized from full list of generated assumptions.

Assumption	Min	Max	Mean	Std Dev
There is a clear relationship between use levels and associated impacts.	0	70	32.5	19.69
Strong relationship between amount of visitor use and resource impact.	0	50	30.63	17.93
A dichotomy exists between natural and cultural resources.	0	100	28.13	28.61
Visitor density contributes to wildlife displacement.	0	25	8.75	8.93

**mean values are based on individual allocation of 100 points within each category.*

Management Related Assumptions

The assumption that "research influences management decisions" was the highest ranking assumption in this category (m=30). The assumptions that "visitor capacity will solve all our VUM challenges" and "parks and protected areas managers are different from visitors" were the next highest rated, with mean values of 26.88 and 10.63, respectively (Table 2.10).

Table 2.10 Panel rankings of management related assumptions after being categorized from full list of generated assumptions.

Assumption	Min	Max	Mean	Std Dev
Research influences management decisions	10	65	30	18.32
Visitor capacity will solve all our VUM problems.	0	60	26.88	22.90
Parks and protected areas managers are different from visitors.	0	20	10.63	6.34
Urban parks are a stepping stone to more rural experiences, rather than an end goal in their own right.	0	25	9.38	9.82
Increasing diversity in park use is desirous [*sic*] and won't change management priorities.	0	35	8.13	12.23

Desired future conditions should mimic a single historic point in time.	0	40	8.13	12.73
Designating and/or managing agency of PPA matters to visitors.	0	15	6.88	4.96

**mean values are based on individual allocation of 100 points within each category.*

Panelist Comments

A number of comments made by participants spoke to one of the many benefits of a Delphi Study. For example, as one participant stated:

> "Looking at the list now, I'm surprised there isn't anything about "complexity" in the management assumptions. The assumptions are all about managers and the public but not the relationships that managers have with partners etc. or the outside influences (e.g., politics, economy) that drive PPA managerial decisions. I think that as researchers, we often assume that we are looking at a VUM question finite enough that it eliminates some of this complexity, but that is a huge assumption.

And, as another expert expressed:

> "One of the major assumptions in VUM research is protected area policies should be primarily influenced by findings from research with visitors rather than local communities living adjacent to public lands. We tend to assume protected area managers are different than [*sic*] visitors. VUM researchers tend to assume there is a dichotomy

between natural and cultural resources. We assume data with low response rates continue to represent actual patterns. We assume research influences management decisions."

The very nature of the Delphi approach provides a forum of sorts for practitioners and experts in their field to come together and share thoughts and ideas. Additionally, the use of the word "we," in the above statement highlights the collaborative mentality this approach can help facilitate. As previously noted, maintaining anonymity among participants also has the added benefit of removing potential for group-think or group bias (Murray & Hammons, 1995). The following comment continues to support the beneficial role this approach has on sharing ideas with colleagues in a productive and time-efficient way:

"It really gave me pause to see the one about 'visitors care about recreation AND conservation.' I think this is a huge assumption, and one that I hadn't identified earlier."

This underscores the utility of the Delphi approach as a method of sharing new thoughts and ideas in an environment where every voice is heard. Furthermore, it highlights the ability to gather specific, detailed information from a variety of individuals from various locations around the U.S., without having to coordinate a specific time to convene.

Additionally, while comments made by panelists were taken into consideration in the culling process, none were presented as such in this round that would have altered the overall rankings of the generated assumptions.

Delphi Round Three: Final Ranking of Assumptions and Comments

Response rate for the final round of this Delphi study was 88%, with seven out of the eight participants who responded in the second round participating in the third and final round. In this round, participants had now been exposed to all of the assumptions, commented on them, and provided an initial ranking of said assumptions.

Using the established inclusion/exclusion criteria highlighted in the methods, a total of 17 assumptions (from the original 28) were presented to the panel. These remaining assumptions coincided with the aforementioned categories in the following manner: 5 out of 8 management assumptions, 5 out of 12 experiential assumptions, 2 out of 4 resource assumptions, and 5 out of 5 methodological assumptions (Table 2.11).

Table 2.11 Remaining assumptions after second round

Methodological Assumptions
Research is influenced by visitors not local communities.
Data with low response rates represent patterns.
Indicators and thresholds measure social norms.
Behavioral intentions measure actual behavior.
Visitor spatial-temporal behavior is driven by factors we can measure in VUM in predictable ways.
Experiential Assumptions
Visitors act in a rational manner that follows the Recreation Demand Hierarchy.
Visitor perceptions are formed around cognitive hierarchy.
Visitors are motivated to achieve desired outcomes from a recreational experience while protecting the environment at the same time.
There is a strong relationship between the amount of visitor use, crowding, and conflict.

Visitors can perceive and evaluate resource impacts (social or ecological).

Resource Related Assumptions
A dichotomy exists between natural and cultural resources.
Strong relationship between amount of visitor use and resource impact.
Management Related Assumptions
Research influences management decisions.
Parks and protected area managers are different from visitors.
Increasing diversity in park use is desirous [*sic*] and won't change management priorities.
Visitor capacity will solve all our VUM problems.
Desired future conditions should mimic a single historic point in time.

From this updated list of assumptions, the following results were generated.

Methodological Assumptions

The assumption that "indicators and thresholds measure social norms" remained the top-rated assumption (m=35). There was also no change in subsequent rankings, with "visitor spatial-temporal behavior is driven by factors we can measure in VUM in predictable ways (m=23.57) and "behavioral intentions measure actual behavior (m=17.14) continuing to round out the top three rated assumptions (Table 2.12).

Table 2.12 Panel rankings of methodological assumptions after final round of Delphi process.

Assumption	Min		Max		Mean		Std Dev	
	After Rd 2	After Rd 3	After Rd 2	After Rd 3	After Rd 2	After Rd 3	After Rd 2	After Rd 3
Indicators and thresholds measure social norms.	20	20	50	50	31.88	35 (+3.12)	11.16	13.36 (+2.2)
Visitor spatial-temporal behavior is driven by factors we can measure in VUM in predictable ways.	0	0	80	50 (-30)	25.00	23.57 (-1.43)	24.49	17.87 (-6.62)
Behavioral intentions measures actual behavior.	0	0	50	50	21.25	17.14 (+4.11)	15.56	14.85 (-0.71)
Research is influenced by visitors not local communities.	0	0	30	30	12.86	12.14 (-0.72)	10.30	10.64 (+0.34)
Data with low response rates represent patterns.	0	0	35	40 (+5)	10.63	12.14 (+1.51)	13.10	15.08 (+1.98)

**mean values are based on individual allocation of 100 within each category.*

Experiential Assumptions

The rankings of experiential assumptions did change however, with "there is a strong relationship between the amount of visitor use, crowding, and conflict" being the highest ranked assumption (m=25). "Visitors are motivated to achieve desired outcomes from a recreational experience while protecting the environment at the same time" remained highly rated with a mean score of 23.57. There was another change from the previous rankings with the third highest rated assumption now being the assumption that "visitors act in a rational manner that follow the Recreation Demand Hierarchy (Table 2.13).

Table 2.13 Panel rankings of experiential assumptions after final round of Delphi process.

Assumption	Min		Max		Mean		Std Dev	
	After Rd 2	After Rd 3	After Rd 2	After Rd 3	After Rd 2	After Rd 3	After Rd 2	After Rd 3
Visitors are motivated to achieve desired outcomes from a recreational experience while protecting the environment at the same time.	0	5 (+5)	30	45 (+15)	17.50	23.57 (+6.07)	9.35	14.07 (+4.72)
Visitors act in a rational manner that follow the Recreation Demand Hierarchy.	0	0	35	40 (+5)	13.63	20.17 (+6.54)	14.39	13.21 (-1.18)
Visitors can perceive and evaluate resource impacts (both social or ecological).	0	0	45	30 (-15)	10.63	16.43 (+5.8)	14.24	12.16 (-2.08)
Visitor perceptions are formed around cognitive hierarchy.	0	0	30	30	10.50	14.29 (+3.79)	10.81	9.42 (-1.39)
There is a strong relationship between the amount of visitor use, crowding, and conflict	0	0	35	60 (+25)	10.38	25.00 (+14.62)	12.39	21.21 (+8.82)

**mean values are based on individual allocation of 100 points within each category.*

Resource Related Assumptions

Final rankings of resource related assumptions found "strong relationship between amount of visitor use and resource impact" to be the highest ranked among participants (m=52.86) (Table 2.14). While technically representing a change from the previous round, this highlights virtually no change however, in overall attitudes towards this assumption given the

similarity of the previous top-rated assumption of "there is a clear relationship between use levels and associated impacts."

Table 2.14 Panel rankings of resource related assumptions after final round of Delphi process.

Assumption	Min		Max		Mean		Std Dev	
	After Rd 2	After Rd 3	After Rd 2	After Rd 3	After Rd 2	After Rd 3	After Rd 2	After Rd 3
Strong relationship between amount of visitor use and resource impact.	0	10 (+10)	50	100 (+50)	30.63	52.86 (+22.23)	17.93	26.57 (+8.64)
A dichotomy exists between natural and cultural resources.	0	0	100	90 (-10)	28.13	47.14 (+19.01)	28.61	26.57 (-2.04)

**mean values are based on individual allocation of 100 points within each category.*

Management Related Assumptions

The assumption that "research influences management decisions" remained the highest-ranking assumption in this category after the final round (m=30.71). The assumptions that "visitor capacity will solve all our VUM challenges" and "parks and protected areas managers are different from visitors" also remained the next highest ranked assumptions, with mean values of 27.86 and 20.71, respectively (Table 2.15).

Table 2.15 Panel rankings of management related assumptions after final round of Delphi process.

Assumption	Min		Max		Mean		Std Dev	
	After Rd 2	After Rd 3	After Rd 2	After Rd 3	After Rd 2	After Rd 3	After Rd 2	After Rd 3
Research influences management decisions.	10	0 (-10)	65	50 (-15)	30.00	30.71 (+0.71)	18.32	14.07 (-4.25)

Visitor capacity will solve all our VUM problems.	0	0	60	50 (-10)	26.88	27.86 (+0.98)	22.90	13.21 (-9.69)
Parks and protected areas managers are different from visitors.	0	0	20	50 (+30)	10.63	20.71 (+10.08)	6.34	12.16 (+5.82)
Increasing diversity in park use is desirous [*sic*] and won't change management priorities.	0	0	35	50 (+15)	8.13	15.00 (+6.87)	12.23	9.42 (-2.81)
Desired future conditions should mimic a single historic point in time.	0	0	40	30 (-10)	8.13	5.71 (-2.42)	12.73	21.21 (-8.48)

**mean values are based on individual allocation of 100 points within each category.*

Panelist Comments

Comments produced continued to highlight the beneficial nature of this type of forum for sharing ideas. As one participant stated:

> "I differ with other panelist [*sic*] in my belief that the rational actor is an assumption of VUM research that is not always true. It seems like other folks think that rational actor theories are well supported and applicable. But let's think about past use history: when we ask people how many days in an average week they visit a specific place, or how many days in a season they hike, or ski days in a year they likely aren't doing calculations (rational) - they are likely using heuristics (shortcuts). That's the opposite of rational decision making. It doesn't make them irrational per se, it just means the

survey respondent is satisfied or doing just enough. We then calculate these scores and report them as objective metrics, albeit with confidence intervals, but nonetheless the assumption is that their scores aren't a product of other unconscious factors (weather, emotions, attentional fatigue, etc.). As for environmental considerations, I think visitors are motivated to consider, but those motivations are often misinformed or misplaced."

Another participant stated the following:

"That research influences management and specifically that visitor capacity is a silver bullet research/management vein are definitely the most prevalent assumptions of this list. While I'd hope it's true that our research influences management, there's a need to be creative about how we communicate with managers and expansive about areas we examine for addressing VUM challenges."

Both of these comments continue to underscore the benefits of this research as a way for experts in a similar field to share thoughts and ideas on an important subject. Furthermore, the observation of one another's comments while maintaining anonymity allows for a non-threatening and open environment for everyone to have a voice.

Discussion

Overall, this Delphi survey methodology created a successful forum for experts in the VUM field to come together, share what they believe to be assumptions present in the VUM field, comment on each other's assumptions and share their own thoughts and beliefs on those assumptions.

While relatively unused in the field of PPA and outdoor recreation in general (Fefer, 2016), the Delphi approach has a rich archive of application in other disciplines with its ability to bring experts together to reach a consensus on a particular subject. Given the timing of this research project and the circumstances surrounding the COVID-19 pandemic, this approach was particularly beneficial in gathering information in a timely manner without having to coordinate individual or group meetings with every participant.

Additionally, the fact that data collection continued through the end of the semester - typically a busy time for academics - this approach further allowed for participants to complete the survey rounds at their convenience, while staying within the time frame of the project. Despite these complications, this process yielded beneficial results in how to better understand prevalent assumptions that may impact VUM research and subsequent management actions within PPAs.

This is particularly relevant to the application of the Interagency Visitor Use Management Framework (IVUMF) throughout U.S. public lands, a framework that is currently the systemized approach to VUM and will be for the foreseeable future. Given that one of the top assumptions was that *indicators and thresholds measure social norms* and given that the IVUMF relies on the use of indicators and thresholds to guide its management strategy, a more thorough understanding of how this assumption influences this process is essential. If there is more to understanding VUM related social norms than the application of indicators and

thresholds, it is important that those variables are not only recognized and understood but implemented in conjunction with the components that comprise the IVUMF.

Similarly, the high-rated assumption that there is a *strong relationship between amount of visitor use and resource impact* further highlights an opportunity to investigate this correlation between levels of visitor use and potential impacts to the natural resources. This has implications for the direct application of the IVUMF, as impacts to the natural resource may be used as a potential indicator, as well as to the overall perceptions of PPAs in questions. For example, from whose perspective is this relationship being witnessed by; the visitor or the manager? As these two populations may have very different beliefs and sensitivities towards this association, it becomes important to discern what exactly this assumption means and how researchers may use that understanding, along with the understanding of other VUM related assumptions, to improve the overall research process.

Kirkwood and Price (2013) put it bluntly; "Researchers' beliefs and assumptions shape the research they undertake (p. 536)." While the overall prevalence of assumptions in VUM research requires its own study, this investigation made it abundantly clear that there is a myriad of assumptions that exist, regardless of whether or not there is consensus on just how prevalent they are. Even if there was no agreement at all concerning a given assumption, the fact that one expert believes it to be present has implications for how VUM research may transpire. The question is whether or not these assumptions have any significant impact on the end result.

Furthermore, if disagreement *does* exist over certain assumptions – as was suggested by some of the comments – it raises an issue of solidarity and continuity within how these assumptions are addressed within the VUM research field. It is true that many facets of VUM related research exist (e.g. wildlife impacts, social impacts, resource impacts) and each discipline

has their respective goals and agendas. However, whether we are focused on cultural, ecological or social aspects we, as VUM researchers, are all working to achieve the same thing; protection of the resource and sustainment of the recreation and visitor experience. Therefore, disagreement over the aforementioned assumptions should not deter the advancement of VUM related research in its entirety, regardless of one's specialty.

Despite a lower than anticipated response rate, the breadth of field experience within the panel generated varied, yet beneficial, results. This span of experience, possibly along with the geographic differences and even types of projects these experts had been, or currently are, involved in may contribute to this variability. Yet despite this it is clear that, even before any kind of consensus was reached, there was some level of agreement in the prevalence of the generated assumptions. This indicates that no matter what it is, there is some level of agreement among experts that suggests these assumptions have been present in the VUM field for a number of years.

While results are thought-provoking, future research would lend additional insight into specific levels of consensus among the panel members. This would add further depth to the role experts believe these assumptions play in VUM research and subsequent management decisions. Along with the added benefits of more research participants (i.e. VUM experts) on the panel, incorporating methods such as the Group Conformity Index (GCI) could be applied to better understand how participants observe group points of view, particularly as understanding *how* those levels of consensus are influenced by the Delphi process itself (Birko et al*,* 2015). Furthermore, there are possible implications in how experience level may influence beliefs towards prevalence of certain assumptions in VUM research, which would also warrant further investigation.

This study also would have benefited from higher levels of participant comments during each round. One of the key aspects of the Delphi process is the ability for participants to comment on not just the generated information of the given study but also on the comments of fellow panelists. Furthermore, a deeper "conversation" among participants adds depth and high-quality results, avoiding only high-level information and explanation. This results in some level of interpretation on the researcher's part, something that is subject to its own level of limitations and assumptions.

Results from this study highlighted the interdisciplinary nature of the field of VUM. The variety and depth of assumptions generated by VUM experts underscored this interdisciplinary nature. While targeted, discipline-specific research and data collection is no less important, I would argue that efforts made to achieve a more comprehensive and all-encompassing approach to VUM related research could be beneficial. For example, how can the objectives of wildlife research in national parks be better matched to, and even support, the objectives of a visitor use study in the same national park? How can these studies achieve their individual goals while supporting the overarching goals of the park and the ecosystem therein? Furthermore, how can we show that one assumption that may not be universally accepted or agreed upon actually has important implications in the overall effort to protect the resource, in whatever form? These are just a few of the questions that should be addressed in the VUM field and which could have valuable and positive impacts on the future of VUM related research.

Conclusions

The goals of this study were to identify and highlight assumptions in VUM research. Results from the Delphi study made it abundantly clear that inherent assumptions do indeed

exists within the VUM field. These assumptions were generated from a panel of self-identified VUM experts with over 50 years of combined experience in the field as principal investigators and/or project coordinators. Despite limitations in the sample size, results satisfied the study objectives of highlighting inherent assumptions in VUM research and underscores a need for additional research surrounding these assumptions and their potential influence.

Additionally, this study continued to underscore the utility of the Delphi approach to gather useful information in an effective and timely manner, despite not being able to meet in person or even together at the same time. The ability to bring a pool of experts in the VUM field together in this way and generate this data further demonstrates how this approach could, and perhaps should, be used more frequently as in other disciplines.

As the urgency to produce effective results in PPAs across the U.S. rises along with the trending increase in visitation to these areas, it becomes even more critical to identify and understand underlying assumptions within the research process. If the IVUMF represents the current foundation of VUM planning and research for federal lands in the U.S. for the foreseeable future, it is critical that we evaluate effectiveness of the metrics.

Therefore, it is critical to understand how the aforementioned assumptions impact current and future VUM research methods and how this may be impacting management of PPA across the U.S.. This Delphi study was useful in bringing the conversation of research assumptions to light and additional studies would lend further credence to the role they actually play.

Chapter 3 - Thinking like a visitor: A case study of parks and protected area managers judgment of visitor perceptions and norms

Abstract

Rising trends of visitation to a variety of parks and protected areas (PPA) around the United States (U.S.) highlight a continued need for effective management decisions and actions that not only help conserve natural resources, but the visitor experience as well. The application of visitor use management (VUM) strategies and tools has been steadily developing as a discipline to meet the changing recreation needs and behaviors of visitors, yet it is important that these methods and approaches are appropriately evaluated to maintain their efficacy. Manager assumptions and preconceived notions can play into this efficacy. Using data from a visitor use study conducted at a U.S. national park, this study investigated the PPA manager-visitor relationship and, specifically, the idea that managers often misunderstand visitor preferences and needs. Park managers were asked to respond to the same surveys their visitors participated in, in an effort to anticipate the responses of said visitors. Overall, results indicated that managers at this particular park were accurate in anticipating visitor responses and preferences, in addition to visitor levels of acceptability of management aspects such as wait times for parking and other experiential factors. However, results also highlighted a discrepancy between manager and visitor perceptions of crowding, indicating a lack of understanding from managers of an important metric used in VUM research. Results from this study have important implications not only for how VUM researchers understand assumptions in the discipline but also how PPA managers approach their decision-making process, particularly those decisions that impact the visitor experience.

Introduction

The trend of rising visitation numbers to many parks and protected areas (PPA) across the United States (U.S.) has generated the need for effective visitor use management (VUM) research to help managers of these areas address the resulting impacts that occur. Over the years, a variety of methods and tools have been developed to address the cultural, ecological and social impacts that often results due to park visitation in any numbers. Visitor surveys (Rossi et al, 2015), trail counters and human behavior cameras (D'Antonio & Monz, 2016), GPS Visitor Tracking (GVT; Stamberger et al, 2018) and photographic panels (Cribbs et al, 2019) and other visual aids are just some of the methods used by VUM researchers and managers to obtain quantitative data on visitor perceptions, impacts, and overall trends in visitation. However, as effective as these methods can be in helping to manage both the visitor experience as well as natural resources, it is important that researchers also recognize and understand the inherent assumptions that are often incorporated into many of these methods. Assumptions that can have important implications for how researchers approach VUM research and ultimately impact how protected areas are managed.

Assumptions can be an inherent part of any research project (Burgess-Limerick et al, 1994), and while there is frequent mention of how assumptions can impact the research process, specific mentions of assumptions in VUM-related issues are scarce. However, a recent study did shed some light on a number of built in assumptions that are present in the VUM research field (see Chapter Two). These assumptions were, via a Delphi survey, generated by a number of VUM experts from the U.S. (see Chapter Two). The results from that study indicated that one), assumptions are very much a part of VUM-related research and underscored the need to better

understand just how those assumptions may impact future VUM research and two), suggested that these assumptions may have direct influences on management decisions making processes and actions as well.

This study sought to better understand how those assumptions are influencing not only data collection that helps inform management decisions but also the role assumptions play in how PPA managers approach their decision-making process, particularly those decisions that impact the visitor experience. With the Interagency Visitor Use Management Framework (IVUMF; IVUMC, 2016), and the reliance on indicators and thresholds becoming the systemized approach to managing federal public lands across the U.S., it becomes even more critical that VUM researchers and managers of these lands are gathering, and using, the best data possible. Furthermore, it is important to understand and evaluate the role managers have in implementing this approach as management intent and effectiveness (Pressey et al, 2015), as well as their ability to judge how visitor perceptions, norms, and desires may impact the overall success of implementation.

Managers may misjudge the perceptions or concerns of their visitors (Farrell et al, 2001), thereby negatively influencing management decisions. These may be decisions related to management of the natural resources that are contrary to visitor recreational preferences (White et al, 2001) along with the fact that managers may ascribe their own values and beliefs into those decisions (van Riper & White, 2008), neglecting to consider public opinion when appropriate. Furthermore, evidence suggests that these differences in perceptions and decisions arise from specialized training (Kennedy, 1985) and academic environments that may further the divide between manager and visitor (Brunson, 1992).

Therefore, this study seeks to investigate the degree of this divide and the general assumption that PPA manager's perceptions of use and conditions differ from the visitors to their respective parks. By examining data collected from a 2017-2018 visitor use study conducted at U.S. national park in the Midwest, this study seeks to answer the questions:

1. Are PPA managers able to accurately predict visitor reported norms and preferences? and,

2. What are the implications of possible differences in perceptions between managers and visitors in how PPA management decisions are made?

Literature Review

Visitor use management is defined as "…the proactive and adaptive process for managing characteristics of visitor use and the natural and managerial setting using a variety of strategies and tools to achieve and maintain desired resource conditions and visitor experiences" (IVUMC, 2016). These characteristics may include recreation type (Wolf et al, 2018), visitor perceptions, behaviors (Rossi et al, 2015; Roberts et al, 2021) and values (Van Riper & Kyle, 2014), in addition to understanding how visitor use impacts wildlife (Marion et al, 2020) and the natural resource itself (Marion et al, 2016). VUM research, as a discipline, has only been around for the better part of half a century, with advances in the field mainly occurring in the last few decades (Manning, 2011). These developments illustrate its emergent nature as well as its potential for continued development and improvement.

Often linked with aspects of outdoor recreation and the associated impacts therein (Manning, 2011), the field of VUM continued to change with the demands placed on the PPAs visitors frequented (Eagles, 2001). Yet, despite the growth of VUM as a discipline, the amount

of literature related to outdoor recreation and VUM aspects was limited for a number of years (Wolfe, 1964). This began to change in the 1960s and 1970s when an outpouring of studies related to outdoor recreation impacts and management concerns ensued (Manning, 2011), which was greatly influenced by the creation of the Outdoor Recreation Resource Review Commission (ORRRC) in 1958. The ORRRC is often credited with cementing recreation as a critical component in the establishment of Multiple Use mandates, as well as making recreation a permanent fixture in resource management planning policy (Olson, 2010), all of which have direct application to current VUM protocols.

Despite the development and growth of terminology and specific focal areas related to outdoor recreation impacts and VUM, such as recreation ecology (Monz et al, 2013), wilderness specific impacts (Cole & Landres, 1996), and even computer simulation (Lawson, 2006), historically there has not been a common approach to management goals in PPAs (Cerveny et al, 2011). Moreover, despite the use of concepts and approaches such as carrying capacity, the Recreation Opportunity Spectrum (ROS), and Visitor Experience and Resource Protection (VERP) frameworks, little to no early coordination between agencies existed. Furthermore, Manning (2011) highlights complications with many of these frameworks, such as in determining how much impact should actually be permitted in one area (carrying capacity) and who, or what, actually "determines the limits of acceptable change?" (pg. 85).

This lack of coordination began to change in 2016 with the introduction of the Interagency Visitor Use Management Framework (IVUMF). Developed by the Interagency Visitor Use Management Council (IVUMC) in 2016, the IVUM Framework serves as a guide for managing visitor use on all federally managed land (IVUMC, 2016). In other words, the same strategic approach to managing visitor use was thus codified across all federal public lands, be

they National Park Service lands, U.S. Forest Service lands, Bureau of Land Management land, or Army Corps of Engineers land.

While the IVUM Framework does not represent a necessarily novel approach in the sense that its methods are unique or original, in fact many parts of it incorporate ideas and methods of past frameworks such as LAC and VERP, it does provide methods that can be universally adapted and integrated into existing management planning and decision-making processes. Indicators and thresholds, for example, have been used for many years as an informative and defensible way for managers and researchers to monitor visitor use impacts (Manning, 2011). However, the fact that the methodological process of implementing indicators and thresholds across all federally owned lands and waters has now been applied speaks to the importance of evaluating the efficacy and longevity of these processes. A lack of understanding in how effective the tools and methods are in this approach to VUM issues opens the doors to skepticism of the management actions taken using such methods. Therefore, it is essential that their application is not negatively influenced by pre-conceived notions and assumptions.

Normative Theory, Indicators and Thresholds

A common theory in VUM to better understand and address VUM issues is normative theory and the use of an indicator and threshold approach. Normative theory suggests that park visitors have shared beliefs about important aspects of their experiences (Manning, 2011). These preferences for conditions are often referred to as norms (Shelby et al, 1996). *Indicators* refer to specific, measurable characteristics used to monitor changes in certain conditions in addition to serving as proxies for desired conditions (IVUMC, 2016). *Thresholds* are the level at which visitors are no longer willing to accept a given condition as acceptable (IVUMC, 2016).

Norms can be identified in protected-area research by asking visitors to identify important aspects of their experiences and then asking them to rate the acceptability of a range of conditions for that aspect of their experience. Normative theory has helped formulate many norm-based indicators from the number of snorkelers in key areas at the Great Barrier Reef (Inglis et al, 1999), number of visitors and frequency of ferry service to Boston Harbor Islands (Manning et al, 2005) and waiting times to view wildlife (Anderson et al, 2010), to name a few (See Manning, 2010 for an extensive list of indicators).

The use of indicators and thresholds, which often uses visitors' preferences and behaviors towards specific impacts in PPAs, has grown considerably over the years and has been increasingly applied across U.S. federal lands and used by their associated managing agencies (IVUMC, 2016). For example, a commonly used indicator in VUM research is encounter rates on a trail as a proxy for conditions related to solitude (Manning, 2011). Thus, an indicator may therefore be the number of people on a trail while the threshold for acceptability is 20 people on that trail. In other words, once this threshold is reached, the "average" visitor will find those conditions unacceptable.

Through the use of these indicators and thresholds and establishing levels of acceptability for a variety of conditions, researchers are then able to illustrate this acceptability through the use of social norm curves (Shelby et al, 1996; Manning, 2011; Miller & Freimund, 2018; Cribbs et al, 2019; Zajchowski et al, 2019). This is demonstrated in Figure 3.1, in which the given values of specific indicators are placed along the x-axis (e.g. encounter rates on trail) while the levels of acceptability for those conditions are placed along the y-axis. Generally, the highest point on the curve represents the preferred or optimal condition whereas the neutral line depicts a threshold, or minimal acceptable condition. Responses above the neutral line are often considered the range

of acceptable conditions, while responses below the neutral line represent conditions that are unacceptable or violate the threshold of the indicator.

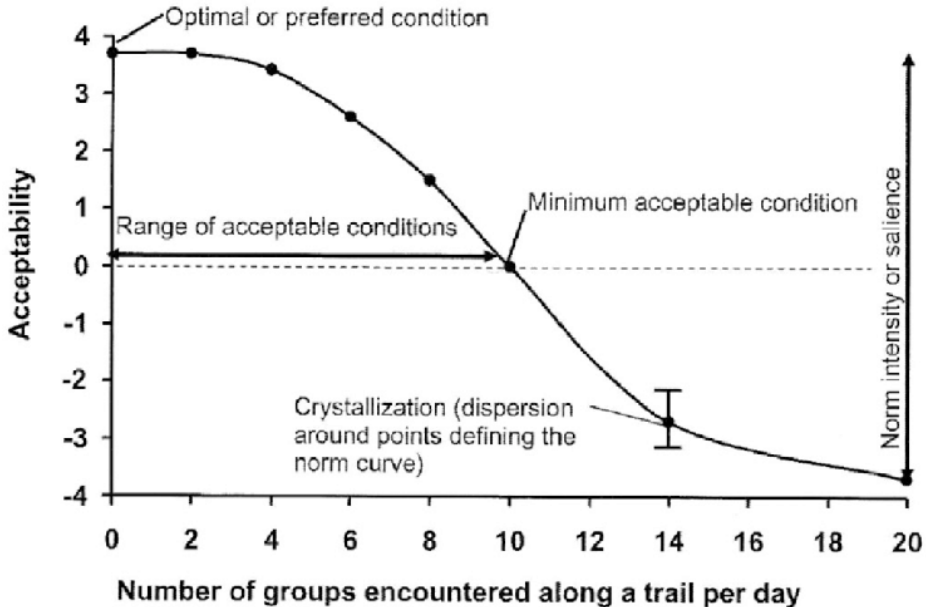

Figure 3.1 Hypothetical social norm curve (Manning, 2011).

Furthermore, the Potential for Conflict Index (PCI2) to evaluate 'norm crystallization,' or the level of agreement regarding visitors' evaluation of site conditions (Vaske et al, 2010) may be applied. The PCI2 spans from zero (maximum agreement, or minimal potential for conflict) to one (minimal agreement, or maximum potential for conflict) and describes a variable's central tendency and dispersion using visuals incorporated into the social norm curve. When successfully applied, these norm curves can offer insight into the evaluative nature of PPAs.

These indicators and thresholds can be applied to a variety of environments (Manning & Krymkowski, 2010; Anderson et al, 2010; Sayan et al, 2013; Vaske et al, 2013; Miller & Freimund, 2018), however their application in VUM-related issues should be carefully considered for a number of reasons. For example, aspects of validity need to be addressed

(Manning et al, 2001) – are the methods used (i.e. norm curves) actually measuring what is intended to be measured? Additionally, it is difficult to evaluate the desired conditions of visitors longitudinally (Nettles et al, 2020). In other words, it can be challenging to address the usefulness of established norms over time. Furthermore, a lack of clear guidelines regarding norm crystallization underscores the issue of "what constitutes 'high' or 'low' levels of agreement" (Manning, 2011, pg. 156). Therefore, it is important that researchers in the VUM field fully understand these limitations and make efforts to address them as well as understand how they may impact management decisions and actions.

With this normative approach being commonly used in the VUM field (Allen, 2019), it is important to understand how these norms may change over time, as this is an underlying challenge when it comes to the implementation of this approach (Kuentzel & Herberlein, 2003: Cole & Stewart, 2002). In other words, managers must ensure that their management actions are in line with the dynamic nature of visitor norms, behaviors, and preferences. Moreover, it is important to understand how researchers and managers alike approach their evaluation of these norms. Needham et al (2004) highlighted the importance of research investigating a variety of normative standards and seeing the broader picture when it comes to understanding a variety of visitor use issues. As VUM research often informs direct management action (Pettebone et al, 2013), it is therefore beneficial to understand the role that manager perceptions and preconceived notions have on broader aspects of VUM components and the overall visitor experience.

Manager vs Visitor Perceptions and Assumptions

Adapting scientific data to practical information for managers can be challenging (Possingham et al, 2001). This transfer of research data to management action can become even

more convoluted when preconceived notions and preferences of managers are contrary to the preferences of visitors. In other words, if manager perceptions do not align with the perceptions and desires of their visitors and management action goes against those desires, an undesirable visitor experience may be the result. This is exemplified in a study that showed visitors in a wilderness area preferred open areas with less vegetation while managers regarded similar areas and the associated vegetation loss negatively (White et al, 2001).

These inconsistencies between visitor and manager perceptions may lead to misunderstandings and misgivings surrounding management actions (Dorwart et al, 2004), potentially alienating a valuable stakeholder in PPAs – the public. Park managers have the difficult role of protecting natural resources in addition to providing a variety of recreational opportunities (Manning, 2011). Therefore, it is important to recognize the preconceived notions of managers as well as understand how the aforementioned training they receive may impact their decision making and actions taken, particularly if these actions differ from visitor perceptions and negatively impact their experience.

A further issue that has received little, if any, consideration is the influence of assumptions on the application of indicators, thresholds, as well the research and management process within the VUM field. D'Antonio & Monz (2016) touch on spatial-temporal assumptions in multiple national parks and methodological and management assumptions regarding general visitor-use aspects can be found in Manning (2011). Additionally, Hall (2000) specifically makes note of "unquestioned assumptions that have guided policy (pg. 39)" and, while speaking specifically to wilderness areas, highlights managerial and experiential assumptions which can be applied to a variety of PPA settings. And despite the most recent constructive evaluation of assumptions regarding photo panel presentation order on visitor

perceptions of crowding (Cribbs, 2019), there still remains a dearth of information in the literature regarding *addressing* other assumptions, such as visitor travel patterns changing with use levels.

Understanding how assumptions impact VUM research is important at any level. However, it becomes increasingly important to understand their implications in relation to federally managed PPA as their management strategies and protocols have been centralized through the Interagency Visitor Use Management Framework. If methodological, experiential, and other related assumptions are influencing the research process at any point, it is important for managers to understand those influences and ensure that steps are being taken to account for them.

Furthermore, it is important to understand the assumptions and preconceived notions of the managers *themselves* and the role they play within this process, particularly when it comes to understanding normative behavior and perceptions among visitors. As the literature suggests, a gap often exists between the perceptions of managers and their visitors (Vining & Ebreo, 1991). Therefore, this case study seeks to investigate the role preconceived notions and assumptions of PPA managers has on the management decision making process and identify the level of divergence between manager perceptions of visitors and the perceptions of the visitors themselves.

Methods

Study Area

The focal park used in this study covers over 60,000 acres, 30,000 acres of which are federally designated wilderness. It contains unique geological, ecological, and cultural features,

and has a diverse mammal community including American bison (*Bison bison*), pronghorn (*Antilocapera americana*), and prairie dogs (*Cynomys ludovicianus*). In addition, the climate of the park and the surrounding area is unique in that climatological extremes are commonplace. Summer temperatures range from 20 - 26° C (68 – 78° F) but often exceed 32 – 37° C (89 - 96° F). Average rainfall for the summer is ~5 inches (12 cm) (World Climate, 2019). Winter temperatures range from -9 – -5 ° C (15 - 23° F) and average snowfall is ~75 inches (190 cm) (NOAA, 2019).

General visitation to the park was ~700,000 in 2019 (NPS, 2021a). Despite overall visitation fluctuating over the past decade, not least of all the decrease in visitation in 2020 due to circumstances surrounding the COVID-19 pandemic, there has been a general trend of rising visitor numbers to this particular park in the previous ten years. Furthermore, overnight stays have been steadily increasing in the park as well. The park hosts a variety of outdoor recreation experiences such as scenic drives, RV and tent camping, hiking, wildlife viewing, educational programs, as well as geological, historical and cultural sights. Furthermore, backcountry camping has been a growing activity within the park and in fact, there was a 250% increase in backcountry campers between 2019 and 2020 (NPS, 2021b), the only type of overnight stay that showed an increase between those years. These experiences not only highlight the myriad of recreational opportunities available to visitors but also underscores the various managerial aspects that staff at this park must manage. With the various social, ecological, and cultural impacts that may occur within the park, it is important that park managers have a good understanding of exactly what impacts are actually occurring as well as be able to provide the best experience possible for the visitor while still adhering to the foundational reason for the park's existence. It is therefore important that any management assumptions and preconceived

notions regarding impacts and visitor experience are recognized, particulary if they are over-generalized or unfounded.

Background Data

Between 2017 and 2018, a visitor use study was conducted across multiple seasons at the park in question (Brownlee et al, 2019). Through the collection, analyses, and interpretation of data collected during this time, resulting information was used to support VUM protocols and associated planning at the park. Using a normative approach guided by indicators and thresholds, objectives of this study included 1) evaluation of visitor frequency, type, and density; 2) understanding park wide patterns that measured visitor uses and preferences; and 3) assessment of various impacts related to visitor use in the park.

Research staff distributed five quantitative surveys at various locations throughout the park. The questionnaires relevant to this study identified indicators of experiential quality in terms of potentially crowded conditions at select locations in the park as well as a survey investigating visitor preferences for management actions. Questionnaires were administered via a tablet computer, specifically a Samsung Galaxy Tablet A6 running Android 5.1.1 (Samsung Electronics Co. Ltd., South Korea). The questionnaires were designed using Qualtrics Survey Software (Qualtrics, Provo, UT) version 1.3.01 and uploaded to each tablet to be used in the field. Responses from the questionnaires were entered into SPSS 18.0 Statistical Software Package (IBM SPSS Statistics, Armonk, NY) for analysis. Standard calculations for leverage, kurtosis, and skewness were used to identify statistical outliers and to verify univariate and multivariate normality of the data (Tabachnick & Fidell, 2001). The researchers then addressed

the research objectives using social norm curves, descriptive statistics, cross tabulations, and means testing. An alpha level of 0.05 was used for all statistical comparisons.

The study sampling period yielded 1,474 completed visitor surveys, with a final response rate of 64.5% and a 2.55% confidence interval (C.I) at the 95% confidence level. Related to this study, 204 visitors completed the management specific survey and 428 visitors completed the threshold survey. The sampling stratification procedures, high response rate, and low confidence intervals suggest that the resulting sample is robust and appropriately represents the visiting population of the park.

Manager Surveys

In May of 2018 (before peak visitation occurs in the park), researchers engaged seasonal, temporary, and full-time staff at the park in a workshop focused on gauging park managers' opinions about potential visitor responses on study questionnaires. Specifically, researchers asked managers to complete the threshold questionnaire and the management questionnaire by offering answers that would best align with how they felt the average visitor would respond. In other words, managers were asked to anticipate how visitors would likely answer each question and compare those speculations with the average visitor response. Thirty-two managers participated in these questionnaires, a result of a census sampling approach for almost all staff involved in the 2018 summer season.

Researchers aggregated managers' responses and evaluated the accuracy of those responses with visitor responses from the summer of 2018 and 2017. SPSS Statistical Software was used to run independent samples t-tests to evaluate the statistical differences (or lack

thereof) between managers' speculations of average visitors' responses and actual visitors' responses.

Limitations

While this study produced beneficial results, it is not without its limitations. First and foremost was the fact that on-site data was unable to be collected as this research was conducted in the middle of the COVID-19 pandemic. As a result, existing data from previous visitor use studies was used. While this by no means took away from the quality of the data used, it did restrict the availability of adequate data to address assumptions present in the VUM field.

Furthermore, it should be noted that the data used from the manager surveys at this park are based largely on assumptions themselves. The managers "assumed" what their visitors were reporting. While this too does not take away from the benefits this study highlighted, it does speak to the need to conduct further research based specifically on the perceptions of the managers themselves. Yet, it is beneficial to know that managers can think like their visitors, and that has value in and of itself. However, it would only further the investigation of the role this, and other, assumptions have on the VUM research process and resulting management decisions made as a result.

Lastly, results from this study speak to one specific national park in the U.S. While some of the implications may be applicable to other national parks and natural areas, results should not be taken as blanket statements for all PPA around the U.S..

Results

Thirty-two staff and managers at the park completed the management survey as well as the indicators and thresholds survey given to visitors during the 2017-2018 data collection period. This pool represented nearly the entirety of all staff (hereafter referred to as managers) employed during the 2018 summer season. Manager positions at the park varied (Figure 3.2), ranging from maintenance to administration to resource management. Years of employment ranged from less than one year to 20 years (Figure 3.3).

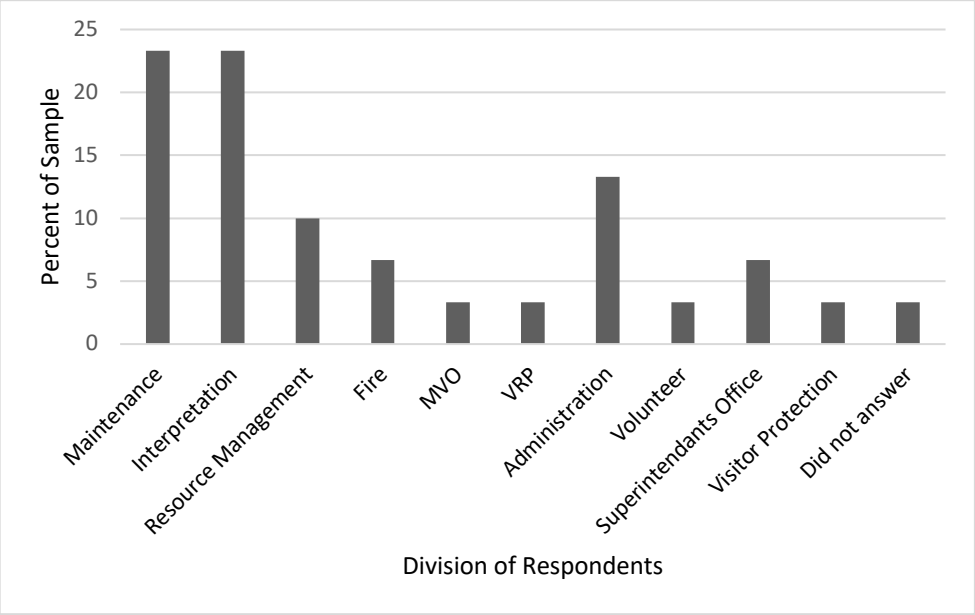

Figure 3.2. Breakdown of manager positions at the focal park.

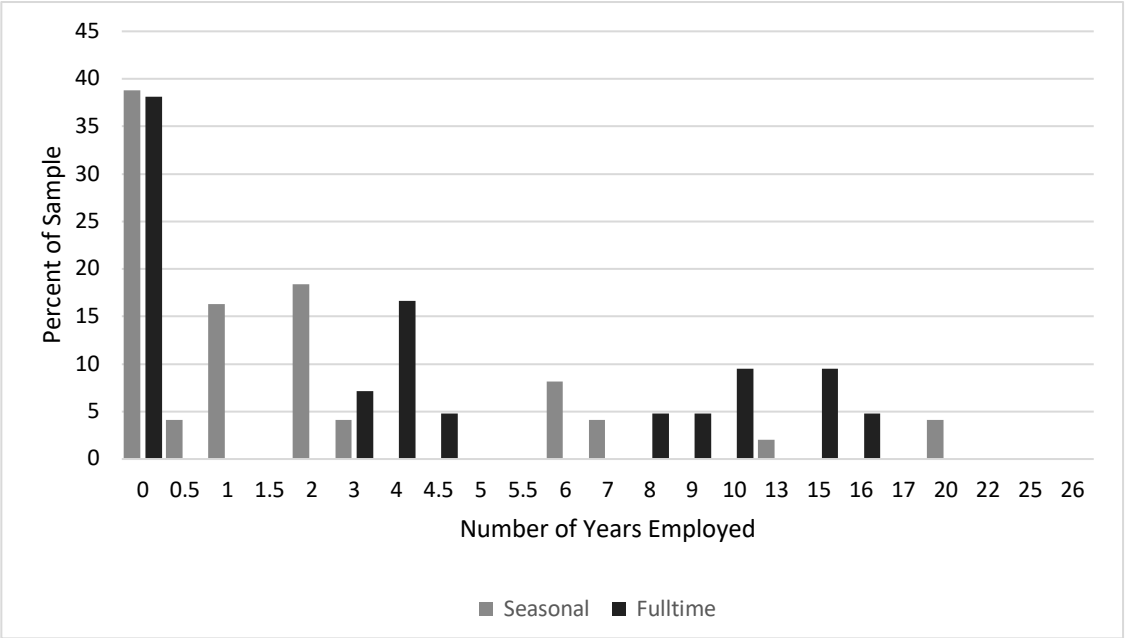

Figure 3.3 Respondent's number of years employed at the focal park.

Management Actions and Visitor Satisfaction with Park Services & Facilities

Overall, and based on means of responses and t-test results, managers accurately anticipated visitor responses for 12 out of 22 management actions, resulting in managers being 55% accurate in anticipating visitor responses. Among others, managers *overestimated* visitor support for a permanent visitor center in a section of the park (M=6.28 managers, M=5.66 visitors; t(52.618) = 2.136, p = 0.037), the improvement of existing restroom facilities at park campgrounds (M=6.19 managers, M=5.62 visitors; t(66.304) = 3.076, p = 0.033), providing more parking spaces at pullouts and parking areas along scenic drives (M=5.56 managers, M=4.93 visitors; t(221) = 2.406, p = 0.017) and providing more restroom facilities (M=5.88 managers, M=5.39 visitors; t(50.053) = 2.321, p = 0.024). However, THRO managers *underestimated* visitor support for maintaining the herd of longhorn steers in the North Units of the park (M=5.47 managers, M=6.24 visitors; t(226) = -2.693, p = 0.008), increasing the number

of backcountry trails (M=4.75 managers, M=5.63 visitors; t(221) = -3.242, p = 0.001), and for reducing the maximum trailer length at campgrounds (M=3.94 managers, M=5.04 visitors; t(47.144) = -3.527, p = 0.001) (Table 3.1).

Table 3.1 Manager perceptions of visitor support for proposed management actions at the focal park, across all survey locations. V=Visitor Opinion, M=Management Perceptions.

Management Action	Population	Mean (SD)	t-test results
Maintain the herd of longhorn steers in the park	V	6.24 (1.53)	*t(226) = -2.693
	M	5.47 (1.30)	p = 0.008
Maintain the herd of horses in the park	V	6.21 (1.23)	t(221) = -0.39
	M	6.13 (1.01)	p = 0.697
Increase size of roadside pullouts and parking areas	V	5.02 (1.52)	*t(52.618) = 2.136
	M	5.50 (1.11)	p = 0.037
Create new roadside pullouts and parking areas	V	4.85 (1.54)	t(219) = 1.365
	M	5.25 (1.44)	p = 0.174
Construct a permanent visitor center	V	5.66 (1.52)	*t(6.018) = 3.075
	M	6.28 (0.96)	p = 0.003
Improve existing restroom facilities at park campgrounds	V	5.62 (1.46)	*t(66.304) = 3.076
	M	6.19 (0.86)	p = 0.033
Use buffers to screen outside development such as oil & gas sites and cell phone towers	V	5.42 (1.60)	t(52.39) = -0.972
	M	5.19 (1.18)	p = 0.435
Reduce maximum trailer length at campgrounds	V	5.04 (1.87)	*t(47.144) = -3.527
	M	3.94 (1.59)	p = 0.001
Increase maximum trailer length at campgrounds	V	4.54 (2.07)	t(220) = -0.419
	M	4.38 (1.72)	p = 0.676
Work with developers adjacent to the park to reduce visual impacts in the park	V	5.43 (1.54)	*t(60.206) = 2.775
	M	6 (0.98)	p = 0.007
Provide more information for visitors about things to see and do in the area	V	5.56 (1.16)	*t(220) = 2.151
	M	6.03 (1.12)	p = 0.033
Increase the number of backcountry trails (Wilderness Trails)	V	5.63 (1.45)	*t(221) = -3.242
	M	4.75 (1.19)	p = 0.001
Provide more short hiking trails	V	5.68 (1.20)	t(221) = -0.083
	M	5.66 (1.29)	p = 0.934
Provide more ranger led programs	V	5.46 (1.28)	t(221) = 1.07
	M	5.72 (1.11)	p = 0.286

Provide more restroom facilities	V M	5.39 (1.34) 5.88 (1.04)	*t(50.053) = 2.321 p = 0.024
Provide more parking spaces at pullouts and parking areas along scenic drives	V M	4.93 (1.42) 5.56 (1.16)	*t(221) = 2.406 p = 0.017
Expand campground loops by creating additional camping spots	V M	5.33 (1.76) 5.56 (1.54)	t(219) = 692 p = 0.490
Install water, sewer, and electrical hookups in campgrounds	V M	4.97 (2.09) 5.50 (1.30)	t(62.305) = 1.935 p = 0.057
Provide running water and showers at restroom facilities at campgrounds	V M	5.39 (1.80) 5.69 (1.12)	t(62.188) = 1.269 p = 0.209
Create new reserved group campgrounds	V M	5.15 (1.97) 5.25 (1.02)	t(77.152) = 0.455 p = 0.651
Improve accessibility at existing park facilities	V M	5.31 (1.43) 5.59 (1.16)	t(220) = 1.062 p = 0.289
Expand existing campgrounds by providing larger loops, larger pull-offs, and additional RV sites	V M	5.20 (1.94) 5.22 (1.48)	t(50.726) = 0.056 p = 0.955

Based again on the means of similar responses as well as results from the t-tests, managers did well in anticipating high levels of visitor satisfaction with park services such as backcountry trail maps and guides (M=5.5 managers, M=5.771 visitors; t(142) = -0.877, p = 0.382), interpretive signage (M=5.828 managers, M=5.881 visitors; t(186) = -0.196, p = 0.845), and ranger-led programs (M=5.286 managers, M=5.513 visitors; t(102) = -0.684; p = 0.495) (Table 3.3).

Similarly, managers at this park accurately anticipated overall high levels of satisfaction with park facilities such as campgrounds (M=5.519 managers, M=6 visitors; t(106) = -1.669, p = 0.098), picnic areas (M=5.621 managers, M=5.894 visitors; t(1.521) = -1.162), and visitor center bookstores (M=5.733 managers, M=5.762 visitors; t(129) = -0.098, p = 0.922).

*Table 3.2 Manager perceptions of visitor satisfaction with park services at the focal park, across all survey locations. *V=Visitor Opinion, M=Management Perceptions.*

Park Services	Population	Mean (SD)	t-test results
Park brochure, newspaper, and/or map	V	6.2 (1.39)	t(194) = -1.204
	M	5.871 (1.43)	p = 0.230
Backcountry trail map and guide	V	5.771 (1.42)	t(142) = -0.877
	M	5.5 (1.48)	p = 0.382
National geographic park map	V	6.076 (1.13)	t(138) = -0.650
	M	5.905 (1)	p = 0.517
Information and directional signs	V	5.953 (1.44)	*t(198) = -2.229
	M	5.333 (1.15)	p = 0.027
Interpretive signs near trailheads	V	5.881 (1.35)	t(186) = -0.196
	M	5.828 (1.26)	p = 0.845
Ranger-led programs	V	5.513 (1.48)	t(102) = -0.684
	M	5.286 (4.56)	p = 0.495
Assistance from park employees	V	6.226 (1.39)	t(162) = -1.456
	M	5.839 (1.07)	p = 0.147
Overall quality of services of park	V	6.25 (1.24)	*t(201) = -1.889
	M	5.807 (0.95)	p = 0.060
Campgrounds	V	6 (1.31)	t(106) = -1.669
	M	5.519 (1.25)	p = 0.098
Trail conditions	V	6.199 (1.07)	*t(36.19) = -3.130
	M	5.379 (1.32)	p = 0.003
Scenic road conditions	V	6.395 (1.11)	*t(35.778) = -5.023
	M	4.936 (1.55)	$p = 1.4x10^{-5}$
Visitor Center exhibits	V	6.331 (1.06)	*t(34.138) = -3.286
	M	5.393 (1.42)	p = 0.002
Visitor Center bookstores	V	5.762 (1.48)	t(129) = -0.098
	M	5.733 (1.20)	p = 0.922
Picnic areas	V	5.894 (1.28)	t(1.521) = -1.162
	M	5.621 (0.940)	p = 0.249
Restrooms	V	5.657 (1.55)	*t(169) = -3.556
	M	4.581 (1.39)	$p = 4.89x10^{-4}$
Overall quality of facilities at the park	V	6.198 (1.11)	*t(196) = -3.747
	M	5.387 (1.09)	$p = 2.36x10^{-4}$

Thresholds and Norm Curves

Norm curves were also created to compare manager and visitor perceptions of people at one time (PAOT) at a popular scenic overlook in the studied national park, manager and visitor perceptions of large animals seen, and perceptions of wait times for parking.

People at One Time (PAOT)

Overall, managers underestimated levels of acceptability regarding PAOT at a popular overlook, with managers anticipating the minimum acceptable number of people on trail (M = 28.12) to be lower than visitors' responses (M = 38.14) (Figure 3.4). Independent sample t-test results for levels of acceptability for different levels of crowding at this overlook showed significant differences between managers and visitors perceptions on all but the second photograph (15 people; managers, M = 2.03 out of 4 = very acceptable, SD = 1.40; visitors, (M = 2.19, SD = 2.31; t(81.723) = .471, p = .639) (Table 3.3).

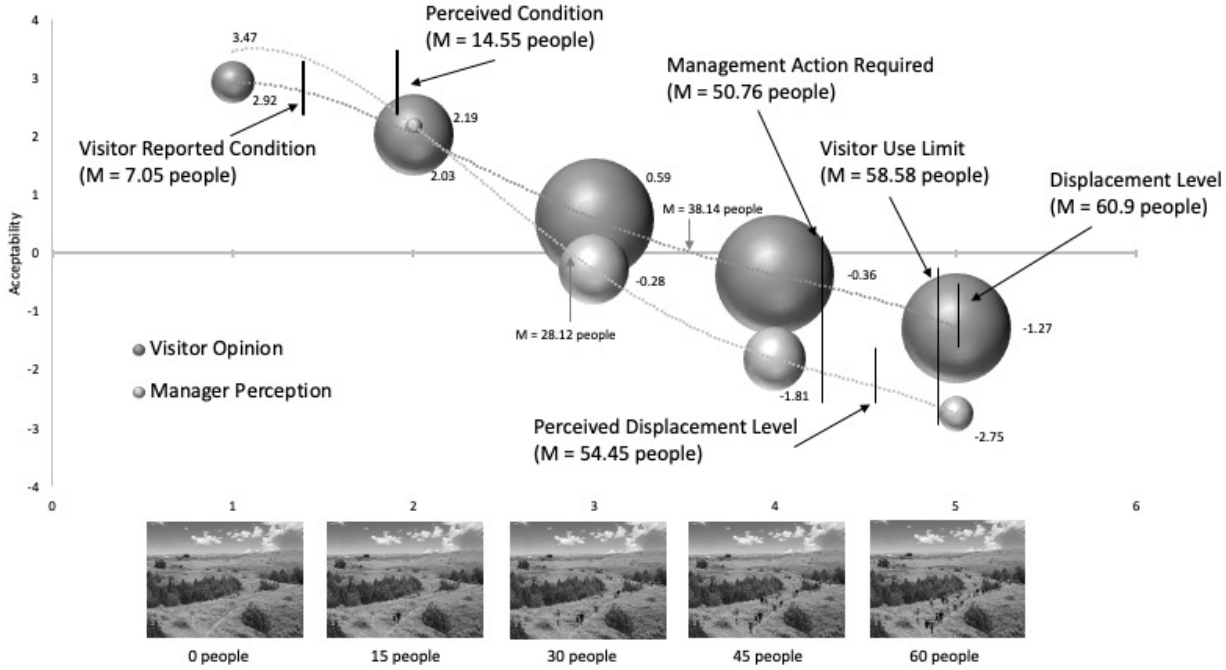

Figure 3.4 Comparison of visitor reports of people at one time (PAOT) at a popular overook in the focal park and managers' perceptions.

Further elucidating the complex nature of using crowding as an indicator were some of the other aspects of the generated norm curve. For example, managers overestimated that the average perceived conditions seen by their visitors had a mean of 14.55 people, whereas visitors actually reported a mean of just over 7 PAOT during their visit. Yet managers *underestimated* the level at which visitors would be displaced (managers, M=4.63, SD=0.79; visitors M=5.06, SD=1.13); t(147)=-2.038, p=0.043), resulting in a statistically significant difference. However, managers were more accurate in their perceptions of when visitors believe management action should be taken (managers, M=4.28 when 6 means no conditions warrant management action, SD=1.09; visitors M=4.49, SD=1.45; t(149)=-0.75, p=0.455) as well as when use limits should be imposed (managers M=4.84 when 7 means use should never be limited, SD=1.72; visitors M=4.97, SD=1.65; t(148)=-0.405, p=0.686).

Table 3.3 Statistical breakdown of manager perceptions versus actual visitor levels of acceptability of People at One Time (PAOT) at a popular overlook in the focal park. Means based on 9-point scale where 4=very acceptable and -4=very unacceptable.

People at One Time (PAOT)	Population	Mean (SD)	t-test results
0 people	V	3.47 (1.96)	*t(109.029)=2.36
	M	2.92 (0.88)	p=0.02
15 people	V	2.19 (2.31)	t(81.723)=0.471
	M	2.03 (1.40)	p=0.639
30 people	V	0.59 (2.49)	*t(65.80)=-2.26
	M	-0.28 (1.78)	p=0.03
45 people	V	-0.36 (2.56)	*t(61.98)=-3.48
	M	-1.81 (1.96)	p=0.001
60 people	V	-1.27 (2.56)	*t(74.40)=-3.89
	M	-2.75 (1.69)	p=0.00

Large Animals Seen in a One Hour Period

Overall, managers were able to accurately anticipate that visitors had lower levels of acceptability for the number of large animals seen per hour. However, managers were more conservative in their perceptions when compared to the actual visitor responses and believed visitors would have a lower threshold than was reported for the number of large animals seen at the park. Managers believed that a mean of 1.48 animals per hour would be the minimally acceptable threshold when, in actuality, visitors reported that a mean of 0.28 animals per hour is their threshold (Figure 3.5). Furthermore, managers accurately anticipated that a lack of witnessing large animals would warrant management action, but managers again slightly underestimated visitor responses (managers, M=0.59 animals seen per hour, SD=0.87; visitors, M=0.96, SD=1.64; t(49.816=-1.236, p=0.042), resulting in a statistically significant difference. Similarly, managers were accurate in anticipating general low levels of displacement related to

the number of large animals seen, yet *overestimated* visitor levels of acceptability of this metric (managers, M=0.47, SD=1.1; visitors, M=0.34, SD=0.47; t(446)=-0.651, p=0.515). T-test results comparing manager and visitor perceptions of acceptable number of large animals seen in one hour showed no differences (Table 3.4).

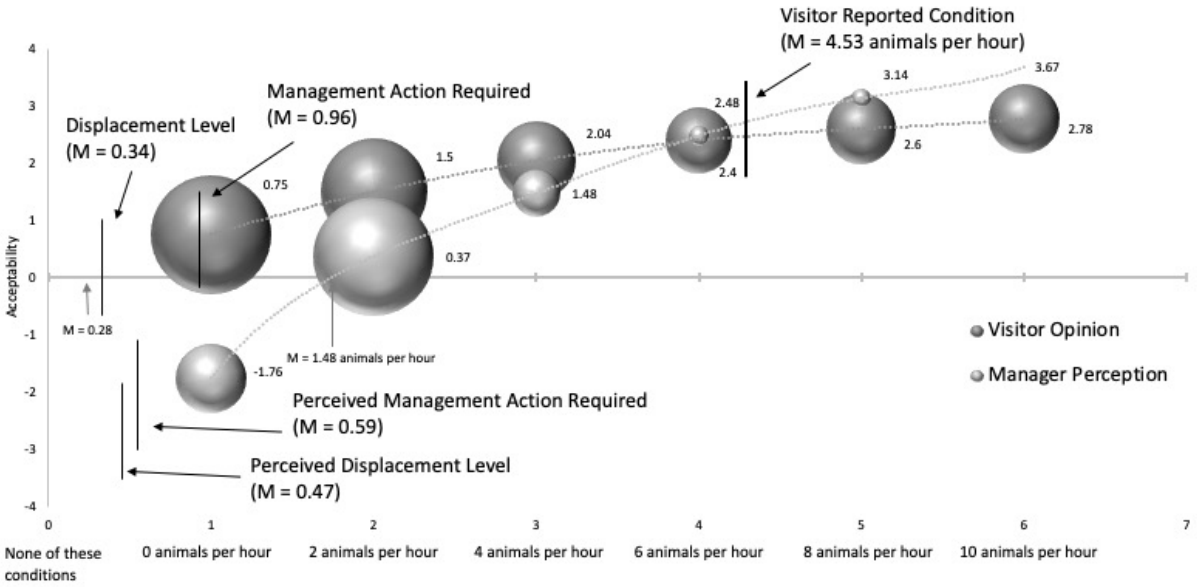

*Figure 3.5 Visitor reports compared to manager perceptions of visitor reports of the number of large animals seen per hour. Note: responses of "none of these conditions" entered as zero to calculate standards of quality. *Large animals identified as bison, elk, horses, pronghorn, bighorn sheep, etc.*

Table 3.4 Statistical breakdown of manager perceptions versus actual visitor levels of acceptability for the number of large animals seen in a one-hour period. Means based on 9-point scale where 4=very acceptable and -4=very unacceptable.

Number of Large Animals Seen	Population	Mean (SD)	t-test results
0 animals per hour	V	0.75 (2.54)	t(384)=0.924
	M	-1.76 (2.66)	p=0.5

	V	1.5 (2.20)	t(363)=0.870
2 animals per hour	M	0.37 (2.216)	p=0.638
	V	2.04 (2.11)	t(343)=0.406
4 animals per hour	M	1.48 (1.82)	p=0.557
	V	2.4 (2.06)	t(341)=0.675
6 animals per hour	M	2.48 (1.89)	p=0.550
	V	2.6 (2.08)	t(334)=0.732
8 animals per hour	M	3.14 (2.05)	p=0.829
	V	2.78 (2.07)	t(370)=0.592
10 animals per hour	M	3.67 (2.07)	p=0.894

Wait Time for Parking

Managers were the most accurate in their perceptions of wait times for parking spaces within the park. Despite a higher manager perceived condition of wait time (M=2.65 minutes vs M=0.35 minutes), levels of acceptability between visitor reported and manager perceptions were nearly identical (Figure 3.6). Managers were accurate in anticipating both visitor levels of acceptability for management action (managers, M=3.53, SD=1.37; visitors, M=3.82, SD=1.65; t(442) = -0.972, p=0.331) and displacement (managers, M=4.34, SD=1.58; visitors, M=4.33, SD=1.69; t(442) = 0.029, p=0.997). Independent t-tests comparing manager and visitor mean scores resulted in significant differences only for the level of acceptability for a wait time of two hours (managers, M = -3.84 out of -4 = very unacceptable, SD = .74; visitors, M = -3.35, SD = 1.62; t(60.874) = -0.392, p = 0.003) (Table 3.5).

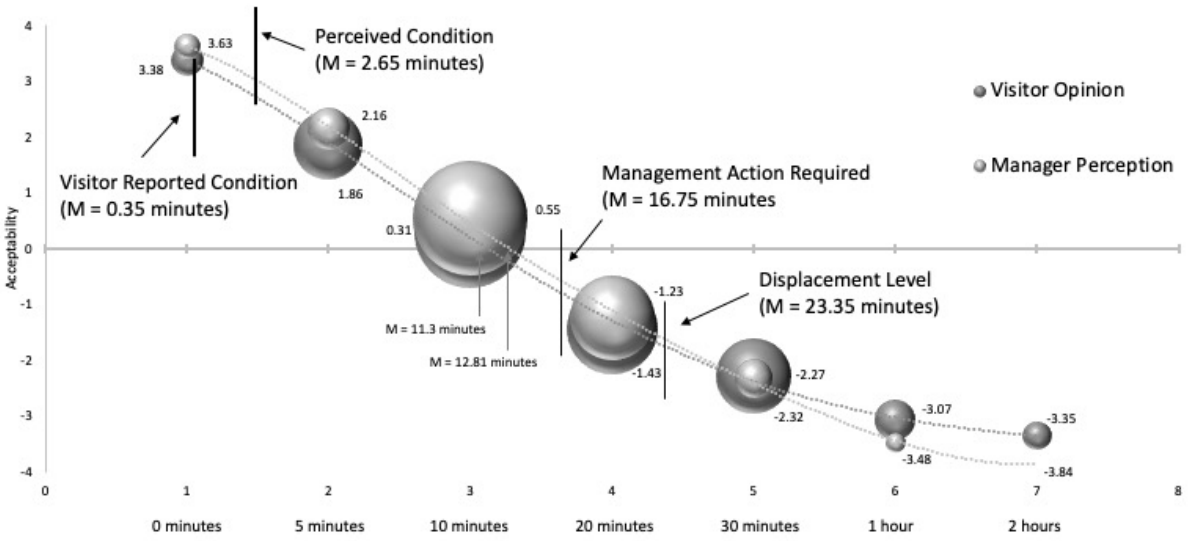

Figure 3.6 Visitor reports compared to manager perceptions of visitor reports of wait times for parking at the focal park.

Table 3.5 Statistical breakdown of manager perceptions versus actual visitor levels of acceptability of wait times for parking at the focal park. Means based on 9-point scale where 4=very acceptable and -4=very unacceptable.

Wait times for parking	Population	Mean (SD)	t-test results
	V	3.38 (1.68)	t(418)=0.115
0 minutes	M	3.63 (1.29)	p=0.414
	V	1.86 (2.27)	t(40.121)=0.940
5 minutes	M	2.16 (1.66)	p=0.353
	V	0.31(2.50)	t(405)=0.653
10 minutes	M	0.55 (2.28)	p=0.610
	V	-1.43 (2.41)	t(408)=0.101
20 minutes	M	-1.23 (2.03)	p=0.650
	V	-2.27 (2.22)	t(40.069)=-0.181
30 minutes	M	-2.32 (1.64)	p=-0.57
	V	-3.07 (1.82)	t(42.077)=-1.707
1 hour	M	-3.48 (1.24)	p=0.095
	V	-3.35 (1.62)	*t(60.874)=-3.092
2 hours	M	-3.84 (0.74)	p=0.003

Cohen's *d* was used to measure effect size throughout the statistical comparisons, which states that the small, medium, and large effect sizes are 0.2, 0.5, and 0.8, respectively (Rice & Harris, 2005). Across these norm curves, effect sizes for the majority of independent t-test remained very small, with no effect size being greater than 0.15. In other words, even those results which indicate significant differences should not be taking as strong indicators of differences between manager and visitor perceptions. Furthermore, while the norm curves between managers and visitors for each variable generally followed a similar shape, the PCI2 values for PAOT and large animals seen in one hour indicate that consensus between levels of acceptability not only vary between manager and visitor, but also between managers. This highlights an opportunity to investigate further the role the PCI2 index plays in VUM research reporting.

Discussion

This study sought to identify whether or not a divide exists between PPA managers and their visitors by investigating how managers are different from visitors, both in their own perceptions as well as how they understand visitor perceptions and preferences. Left untested, this essentially generates the assumption that PPA managers are different from their visitors regarding norms, preferences, and concerns. As is, this assumption has important implications for how PPA are managed, given the fact that if one is to assume managers *are* different in the aforementioned ways, they must then have their own agenda (outside of their duties mandated by law) that is perhaps contrary to the needs and desires of visitors, a viewpoint that is supported in the literature (Floyd et al, 1997; Farrell et al, 2001; Kim et al, 2003).

By examining data from a recent visitor use study at a U.S. national park in the Midwest in which park managers were asked to complete surveys previously taken by their visitors, insight into the impact of this assumption was provided. Overall, results indicated that managers were fairly accurate in anticipating how their visitors responded. Even where statistical differences existed, effect sizes were very low. This indicates that, generally speaking, managers at this park have a relatively good understanding of not only how their visitors respond, but also how those visitors perceive the services, facilities, and their overall experiences(s) within the park.

Therefore, if the general assumption is that PPA managers' perceptions and understanding of visitor norms and preferences are different *from* those visitors, results from this investigation speak to the contrary. Results from this case study present the argument that managers of these areas are, in some ways, similar to their visitors and that they have a greater understanding of visitor preferences and perceptions than commonly thought. Results from this study, and in this particular park, indicate that perhaps more can be learned from investigating and understanding this assumption. If nothing else, it begins to shed light on the importance of reevaluating conclusions made by previous research that parks and protected area manager perceptions are contrary to those of their visitors.

This has important management, research, and policy-making implications. Despite manager responses reflecting what they *believed* visitor responses to be, their responses nonetheless indicated that, if nothing else, managers at this particular national park can at least *think* in the same way as their visitors. It can be posited that if managers of PPA can, more or less, accurately speak for their visitors, they also then have a decent understanding of what visitors' expectations and norms are when they visit other parks or natural areas in the U.S. One

could make the argument that this understanding thus directly impacts the decision-making process within the park itself. This line of reasoning can be applied in two ways:

First, if managers understand the preferences, attitudes, and overall expectations of their visitors, they may have greater motivation to ensure that those expectations are being met. And while, as is in any natural settings, consideration needs to be given to the natural resource as well, the fact that managers can anticipate visitor responses with relative accuracy hints at a forecasting situation of sorts. In other words, with managers being able to forecast what their visitors want, what they are pleased with and what they are displeased with, as well as what their normative behavior is, management strategies can be adjusted accordingly to address those needs, wants, and norms.

Secondly, managers can also use this information to gain a greater understanding of their own assumptions and preconceived notions. Outside of the legal mandates, there are numerous management aspects that have direct impacts on the visitor experience. As highlighted by some of the comparisons of certain management actions and park services at this particular park, managers were not 100% accurate in anticipating what their visitors might prefer or deem acceptable. Public opinion and preferences are a large part of VUM. It is therefore important that park managers are cognizant of, and responsive towards, those preferences. If nothing else, continued investigation into this assumption could help identify preconceived bias by managers and be applied to other aspects of park management as well.

From a research perspective, understanding that managers and their visitors are more alike in their perceptions than we may give them credit for has important implications for the research process itself. Manager collaboration and input is as essential to the VUM research process as visitor input (Dorwart et al, 2004). It is critical that researchers do not begin the

process by having preconceived notions around the idea that park managers are different than their visitors. It would be unproductive and perhaps even damaging to the research process to assume that managers have their own agenda and not recognize that, in many ways, they are essentially a visitor themselves who is simply fortunate enough to work in the park they "visit." A first-rate manager is one that can successfully promote both the protection of natural resources and the provision of quality visitor experiences (Borrie et al, 1999). While this may go without saying, a managers' ability to actually be more like visitors, and think like visitors, can lend itself to this goal. Therefore, it is important for research staff to consider this before making assumptions in collaborative research opportunities.

Lastly, understanding that PPA managers are not so different from their visitors (at least in this example), as well as understanding other VUM-related assumptions, has important implications regarding the implementation of the Interagency Visitor Use Management Framework (IVUMF). With the recent centralization of the IVUMF and associated management strategies in U.S. federally-managed PPA it is critical that managers, researchers, specialists, and other personnel involved with PPA management decisions and policies understand the implications assumptions may have on the process.

Using this studied assumption as an example, recognizing it and acting on that recognition also has beneficial implications regarding how certain indicators and thresholds are implemented. Among other guidelines for establishing indicators, Whittaker and Shelby (1992) highlight the fact that these indicators should be significant to both visitors and managers alike. If those involved with the process understand that manager perceptions are *not* so different from their visitors, or recognize that managers may at least understand visitor perceptions more than credit is given, those indicators and thresholds administered may be better in line to address the

issue at hand. Generally speaking, managers at this park were accurate in their perceptions of various visitor preferences and normative behaviors. If the assumption that managers are different than visitors is encouraged, improper indicators and thresholds could potentially be implemented that would ultimately lead to impractical and irrelevant management actions. In other words, indicators and thresholds may be created that do not actually reflect the given situation.

Finally, it is worth bringing attention to the comparison between visitor and manager perceptions of crowding. With crowding being one of the most studied aspects of VUM (Shelby & Heberlein, 1986; Stewart & Cole, 2001; Fleishman et al, 2004; Vaske & Shelby, 2008; Schultz & Svajda, 2017), it is therefore important to ensure that researchers and managers alike fully understand the use of visitor-perceived levels of crowding as an indicator. In this case, managers overestimated the levels of crowding of their visitors. Furthermore, there was less consensus among managers regarding those levels of crowding. As accurate as the park managers were at speculating on other visitor experiences and preferences, crowding remained a challenge. If managers at this park believe visitors feel more crowded than they actually are, and also disagree to the perceived level of crowdedness, then what does that mean for the use of crowding as an indicator at this park, or in any other park where this may be occurring?

This question deserves further attention, yet it can be posited that even the generalization that park managers believe visitors to be more crowded than they report has important management implications. Managers may be more inclined to take action that goes against the preferences and desires of their visitors if they are basing these decisions off faulty, or inaccurate information. This is where the working relationship between the research and managers becomes paramount. Researchers need to gather substantive information that addresses the issue

at hand and deliver it to management in a way that is both applicable and pragmatic. Recognizing and understanding how assumptions fit into this process is a pivotal aspect of this relationship.

These comments are not meant to insinuate that there is anything problematic in the implementation of the IVUMF, nor are they to insinuate that PPA managers are consciously making decisions that go against the better interest of their visitors. This study seeks to illustrate that having a clear understanding of how management assumptions that exist in the VUM field, and their associated impacts, should be an important consideration for those involved with its process. Particularly now, as the IVUMF will be the standard approach for VUM issues across all federally-owned public lands for the foreseeable future.

Conclusion

The study of outdoor recreation and VUM has gone through many developments over the decades. Those developments have been influenced, in part, by the ever-changing needs and demands that the very nature of the discipline is comprised of. Changing recreation pursuits and interests, technological advances, alterations in visitor travel patterns and behaviors in natural areas, easier access to locations previously left relatively undisturbed. The list goes on. Coupled with these changes have been a myriad of actions, strategies, and policies to address the resulting impacts and issues.

The implementation of these strategies has been just as dynamic as the discipline of outdoor recreation and VUM. The IVUMF, now the most recent strategic "advancement," in the field of VUM is firmly entrenched as *the* approach to VUM-related issues and policy across federal public lands in the U.S., yet it remains relatively nascent and untested. As the field of

outdoor recreation and VUM related issues continues to shift, seemingly at an alarmingly faster rate than ever before, it becomes particularly important to ensure that those involved with its research and processes are evaluating the efficacy of the strategies employed (i.e. the IVUMF).

A better understanding of how assumptions influence both any VUM-related research and the implementation of the IVUMF is a step researchers, managers, and planners can take to make sure that the data collection, analysis, and implementation process is valid. Furthermore, this understanding provides an opportunity for those involved to ensure that the issues and problems being addressed *are* actually the problems and issues that need addressing. The recognition and addressing of these assumptions, often longstanding ones, can only enhance the efficacy and value of VUM research, strategies, and processes.

Chapter 4 - What are they learning and what is being taught? Understanding educational outcomes and instructional influences in recreation-related majors

Abstract

To better understand the nature of what is being retained by the students in recreation-related majors, as well as what is being taught, this study investigates some of the major themes and learning outcomes retained by students in recreation-related majors in several four-year universities around the United States (U.S.). Additionally, this paper builds on research conducted in Chapter Two in which various assumptions in the visitor use management (VUM) field were identified by VUM experts. To investigate whether identified assumptions were being perpetuated in courses that discussed aspects of VUM, semi-structured interviews were conducted with 19 undergraduate juniors and seniors majoring in various recreation-related majors across the U.S. This understanding has important implications for how relevant subject material is disseminated in the classroom as well as for how future parks and protected area (PPA) managers achieve their mission. While results indicated that assumptions presented in previous research were not being overly perpetuated in the classroom, findings do suggest that further investigation into whether assumptions even play a part in these majors is warranted. Results further indicated that potential gaps exist in how recreation-related majors are structured, and offer an opportunity to create more interdisciplinary learning opportunities within these majors. Ultimately, this study sheds light on how students in this field are being prepared for

careers as potential PPA managers, as well as how faculty and instructors of such courses approach the subject matter.

Introduction

While the benefits of an interdisciplinary approach to academics in higher education is well documented (Buchbinder et al, 2005; Dressel & Marcus, 1982; Annan-Diab & Molinari, 2017), approaching the idea of conditioning students, even unintentionally, to think or perceive subject matter in a recreation-related discipline in a certain way is not. Having ascertained that a variety of assumptions are present within the field of visitor use management (VUM) research (see Chapter Two), this study investigates the potential for these assumptions to carry over into the teaching of recreation-related major students in higher education and discuss the implications this might have on the future of parks and protected areas (PPA) management. In other words, are recreation-related faculty promoting assumptions – statements or assessments that are not necessarily rooted in factual evidence – and preconceived notions that may be counterproductive to the application of VUM?

There are 71 academic programs in the United States (U.S.) that are accredited through the Council on Accreditation of Parks, Recreation, Tourism, and Related Professions (COAPRT), which establishes standards within higher education institutions to provide quality education opportunities in the parks, recreation, and tourism related field (COAPRT, 2019). This does not include the dozens of other leisure science, tourism, sport, park management, conservation, and outdoor recreation programs (hereafter called recreation-related majors) that exist nationally that *are not* accredited. With many of these students seeking careers in PPA management (e.g. managers, interpretation and law enforcement rangers), it is important to

understand how these students are being prepared for a position in a PPA and the implications their education can have on their viewpoints towards visitor use opportunities and issues.

It has been established that assumptions are present throughout the research and management action process related to VUM issues (see Chapter Two). It is important to note that these assumptions were generated from VUM experts not only involved with research but who are also involved with educational aspects of recreation-related content, themes, and ideas. This invites the question: if these assumptions are present in the field, then what is preventing them from being introduced to future managers at an earlier stage? In other words, what preconceptions, or even misconceptions, are being established and what is the possibility that these assumptions are being frontloaded even before the research process takes place? Or before PPA managers are in the field making decisions?

Using semi-structured interviews (SSI) with undergraduate students from universities around the U.S. enrolled in recreation-related majors, this study sought to answer the following questions:

1. Are any of the assumptions presented by previous research (see Chapter Two) being perpetuated in classrooms of recreation-related majors?

And if so,

2. What are the implications of these assumptions being propagated to potential future PPA managers and researchers?

Literature Review

The role and appearance of higher education institutions has changed dramatically over the years (Shugart, 2013) and even its current function is up for debate (Lagemann & Lewis,

2015). An increase in for-profit institutions (Chan, 2016), changing cultural landscapes (Staley & Trinkle, 2011), and higher education as a driver for economic success (Kromydas, 2017), to name just a few of these changes. However, a continuing goal of any college or university should be to adequately prepare students to be effective contributors to whatever career they go on to pursue (Simon & Jackson, 2013; Grogan & Andrews, 2002; Okolie et al, 2020). And while it is understood that the subject content matters in relation to the discipline being learned, this study suggests that it is not only the content that matters but the context of that content as well. Regarding subject matter associated with recreation-related education and the field of VUM, it becomes important to identify if the aforementioned assumptions are unduly influencing student perceptions of VUM related issues; students who may go on to pursue a career as a PPA manager or researcher.

Manager input and perspectives are important components of any VUM research study (Franchina & Meier, 2007; Jacobson et al, 2013; Ankre et al, 2016). For any recreation-related major student with aspirations of becoming a PPA manager or being in some position of influence on the decisions that are made, it is important to therefore understand their preconceived notions and predispositions (Lucas & Meyer, 2004) towards issues within this discipline. Preconceptions, and even misconceptions, may originate from a variety of situations and environments, including childhood experiences (Gluhoski, 1994) and prior knowledge (Parsons & Mamo, 2017). Knowledge that can be acquired within the context of higher education and, specifically, the course(s) the student is enrolled in and professional training they are receiving. And while studies of students' preconceptions in disciplines such as economics (Parsons & Mamo, 2017), physics (Aguirre, 1988), natural sciences (Morrison & Lederman,

2003; Robbins 7 Roy, 2007), and education (Wubbels, 1992) exist, there is no evidence of this investigation within the recreation related discipline.

When we consider the fact that, in any discipline concerning PPA, what students learn in the classroom has implications for their future as potential managers of said areas, a recognition of long-standing assumptions in outdoor recreation-related field in higher education should be considered. Broadly speaking, these implications in the education world can be seen both from a facilitator standpoint (Watson & Mason, 2007) as well as from a student perspective (Glisczinksi, 2007). The former referring to the transference of assumptions impacting the given pedagogy, the latter referring to previous assumptions and beliefs of the student being challenged. This challenge of student-held assumptions, and the idea that students should be encouraged to think critically about their own beliefs and attitudes, is a paramount goal of any higher education classroom (Lloyd & Bahr, 2010), or at least should be. However, it is the implications the former has on the educational process of future PPA managers that is a focal point of this study. Furthermore, a general recognition of these assumptions from an instructor standpoint is critical. Not to avoid subconsciously perpetuating them but rather to highlight them and generate an awareness of them.

The role of the instructor in higher education is, of course, a pivotal one within the learning process, as they oversee the delivery of beneficial knowledge and adequate tutelage to their students. In this respect, Skinner's (1968) question regarding educational end-goals is germane to this discussion; "What is the student to do as the result of being taught?" (pp. 200). In relation to this study, students should be learning the appropriate methods, associated policies, and skills (the "what") to go on and become effective managers of PPA (what they are to "do"). A justifiable answer could therefore be that it depends on the "what" that is being taught,

particularly if assumptions built on misconceptions are a part of the learning process. With this is mind, it may even be beneficial to *highlight* these assumptions and promote constructive conversations on them in an effort to better address them in real-life applications.

This is not to insinuate that professors, lecturers, and instructors in higher education are purposefully spreading misinformation to their students. Rather, it is to highlight the implications that spreading misconceptions, even subconsciously, about specific issues or concepts might have on the "what" it is that students will be doing once they leave higher education. Learned misconceptions have been documented in other academic disciplines (Brahm & Jenert, 2019; O'Reilly & O'Reilly, 1987) and it is important to consider the impact that the perpetuation of these misconceptions and assumptions may have on the end goal of addressing a variety of VUM issues. As Britzman & Pitt (1996) state, "What happens when one understanding shuts out consideration of the meanings of another?" (pg. 120).

Additionally, these aspects underscore the importance of understanding *how* students learn. If we are to better comprehend how assumptions and preconceived notions influence the learning process, we can look to the constructivist learning theory as a guide. This theory states that no one meaning exists, but rather that meaning is constructed from individual experiences, ideas, and beliefs (Hannafin et al, 1997; Ültanir, 2012). Furthermore, this theory asserts that the individual (i.e. student) is an active participant in acquiring knowledge (Loyels & Gijbels, 2008) and that the "…teaching must involve transmission of expert knowledge from the teacher to the student" (Fernando & Marikar, 2017, p. 11). It is therefore important to understand how assumptions fit into this transmission of knowledge and how they might influence not only the educational process of recreation-related majors but also the implications they have on future PPA management decisions.

For example, best practices on effectively addressing VUM issues include identifying whether underlying assumptions related to a study are no longer relevant (e.g. visitor behaviors and motivations; Cahill et al, 2018). In this context, ensuring that instructional content adequately reflects these changes and dynamic nature of the discipline is paramount. Visitor perceptions of crowding, one of the most studied aspects of VUM (Shelby & Heberlein, 1986; Fleishman et al, 2004; Vaske & Shelby, 2008; Schultz & Svajda, 2017), offers another example of the importance of ensuring that instructional content of VUM issues and concepts is objective and represents the current and actual situation in any given PPA. Furthermore, O'Connell et al (2005) highlight the potential for historical and cultural beliefs and viewpoints to be unwittingly perpetuated in outdoor recreation-related programs, viewpoints that may be counterproductive to management goals and objectives, as well as to the visitor experience.

These assumptions and misconceptions are not just of relevance to the on-the-ground managers of PPA. They have implications for the VUM researcher, policy maker, recreation planner, and any other position that lends itself to suggesting and enacting management practices that impact the natural resources and visitor experience. Pressey et al (2015) highlight the gap that exists between the purpose of protected natural areas and the policies and actions that guide their management. While conservation practices and ideals (Pimbert & Pretty, 1997), legislative directives (Putney, 2003), and human (i.e., visitor) behavior (Yeung & Marion, 1999) certainly drive management actions and decisions in PPA, the individual role that managers, and their preconceived notions and assumptions, play should also be considered.

This study seeks to better understand the educational backgrounds and experiences of students in outdoor recreation-related majors; experiences of students who may go on to become PPA managers, recreation planners, policy makers, and/or be in any other role that may influence

VUM actions in PPA around the U.S.. As appropriate and unbiased perceptions and viewpoints, in addition to purposeful and effective management methods and goals, should be the desired outcomes of any PPA management decision (Ruschkowski et al, 2013), it becomes important to assess and evaluate the potential for conditioning future PPA managers. This alludes to the "transfer problem" offered by Baldwin & Ford (1988, pg. 123), in which skills and training learned may not adequately transfer to on-the-job tasks and duties (Blume et al, 2010).

Therefore, this study investigates whether the VUM-related assumptions outlined from previous research are being perpetuated in recreation-related undergraduate majors and, if so, what are the potential implications the inaccurate presentation and instruction of those assumptions have on future PPA managers and researchers. Moreover, these questions were approached with the understanding that this methodology is exploratory in nature (Diefenbach, 2009), and that additional information and/or themes may arise not directly connected to the main research questions.

Methods

Semi-structured interviews (SSI) were conducted with undergraduate students enrolled in recreation-related majors at four-year universities. Only juniors and seniors were selected for the interviews, with the intent that these students had been exposed to more subject matter within their discipline and could solicit more thoughts and opinions. This approach follows a purposive sampling method, in which the researcher ultimately decides who the participants will be based on their knowledge and/or experience (Patton, 2002; Etikan et al, 2016). Initially, participants were from recreation-related courses taught by the VUM experts who conducted a Delphi study identifying assumptions in the VUM field (see Chapter Two). However, because very few of the

experts who participated in this study were teaching relevant classes at the time of data collection, additional participant recruitment was required. Additional students were contacted via a professional network of faculty within the recreation-related and VUM field. This networking provided the researcher the ability to contact faculty members who not only were actively teaching courses that discussed aspects of VUM but also were currently conducting, or had conducted, VUM-related research. These faculty connections acted as gatekeepers to their students in relevant courses (DeJonckheere & Vaughn, 2019; Rugkåsa & Canvin, 2011). Of the five universities students were sampled from, two were currently accredited through COAPRT.

Sample size was determined by the availability of participants. Due to the nature of qualitative research, appropriate numbers may range from five to 50, depending on the purpose of the study (Creswell, 1998; Mason, 2010; Morse, 1994). The concept of saturation in qualitative studies is equally ambiguous. The direct application of saturation in qualitative research studies can be difficult, and even the concept itself "provides little practical guidance on estimating sample sizes" (Guest et al, 2006, pg. 59) when it comes to qualitative interviews. However, Hennink et al (2017) offer beneficial insight into the differentiation between *code* saturation and *meaning* saturation; the former referring to when the researcher has "heard it all" and the latter being needed for the researcher to "understand it all" (pg. 591). As codes for this study were not developed a priori, focus was given to meaning saturation, which the authors suggest 16-24 interviews being appropriate.

Semi-Structured Interviews

Semi-structured interviews (SSI), as opposed to unstructured or fully structured interviews, are more informal in nature and while some form of predetermined questions for the

participant exist, there is a certain amount of flexibility in the interview to allow the conversation to flow naturally and adjust to the content brought up by the interviewee (Longhurst, 2003). Interviews of any kind are an effective way to gather valuable, in-depth qualitative data on a variety of themes, topics, and subjects (O'Leary, 2014) and while SSI are not without their drawbacks, they offer several advantages that make the method appropriate for this study.

One of the largest downsides to using SSI is time. Semi-structured interviews are labor intensive and require substantial amounts of time in the set-up and coordination of the interviews as well as the time it takes to conduct the interview itself, which often last upwards of an hour (Adams, 2015). Moreover, there is a considerable time commitment related to the analysis of the data (Alsaawi, 2016). Adding to this time commitment is the general understanding that the individual conducting the interviews has an extensive knowledge of the subject area being discussed (Kallio et al, 2016). This is to provide for follow up questions and inquiry to be addressed if appropriate, which is a documented advantage (McIntosh & Morse, 2015). Furthermore, there are the challenges to the subjectivity of qualitative research methods in general, SSI included (Diefenbach, 2009). However, for the purposes of this study the advantages for outweighed the drawbacks.

Perhaps the most advantageous aspect of SSI is the reciprocal nature of the conversation (Kallio et al, 2016). Unlike more structured interview formats, SSI allow questions to follow a more organic progression, allowing the interviewer to generate supplemental questions based on responses of the interviewee (Bartholomew et al, 2000; Rubin & Rubin, 2005). This flexibility helps add to the richness and depth of the interview (McIntosh & Morse, 2015) as well as allows the interviewer to ask additional probing questions to get at the heart of the inquiry and address relevant tangents (Adams, 2015).

This feedback loop between interviewer and interviewee allows for adequate discussion and analysis of topics and themes previously unforeseen by the researcher (Young et al, 2018). As Diefenbach (2009) underscores, "…qualitative research is *explorative*" (pg. 877). The author goes on to state that, while the researcher may have certain questions in mind (i.e. the interview guide) when beginning the interview process, new questions and investigations may arise throughout the process, an occurrence that the author cites as a sign of "progress" (pg. 877). This flexibility in the qualitative research process is supported by Maso (1986), who asserts that changing the research focus can be an acceptable strategy.

Moreover, this exploratory approach to qualitative research, in conjunction with a descriptive approach, allows for the dissemination of results without being explicitly based in theory (Diefenbach, 2009). However, validity throughout the qualitative research process should still be a primary goal (Golafshani, 2003), something that can be achieved through the recognition of researcher bias and a detailed and verbatim account of transcriptions (Noble & Smith, 2015), in addition to an effective peer reviewing process (Creswell & Miller, 2000). The latter referencing a debriefing of the research by an individual who is deeply familiar with the qualitative process and can offer valuable feedback.

The conversational nature of SSI also has been documented to contribute to a greater relationship of trust between interviewer and participant, allowing further opportunity to generate quality data (Dearnley, 2005; Pathak & Intratat, 2012), particularly when conducted over the phone (Vogl, 2013), or in the case of this study via a Zoom (company, location) audio call.

Interview questions were developed to address the research questions as well as provide more in-depth qualitative data to support the research agenda. An important aspect of SSI, adequate background knowledge of the subject matter, is required to facilitate an effective

interview as well as to develop the interview guide itself and improvise follow-up questions (Kallio et al, 2016). The interview guide (i.e. the questions) not only address the main themes of the study but also is the underlying foundation of the interview itself (Rubin & Rubin, 2005; Taylor, 2005; Adams, 2015).

The first part of the interview guide for this study included questions which explored participants background and influences in choosing a recreation-related major, as well as current plans post-graduation:

Background

- Please tell me your current year and major.
- Please describe what factors and experiences influenced you to choose this program.
- What has been your overall experience with your degree program?
- What are your current plans for employment or continuing education after graduation?

The second part of the guide, which was the bulk of the interviews, included questions related to participants' experience with coursework that discussed aspects of PPA, main themes retained from these courses, management aspects discussed, as well as what issues or problems they believe to exist in PPAs. Participants were also asked about general coursework they have taken in their academic career and if their specific major is missing anything:

Parks and Protected Areas Experiences

- What experience have you had with coursework involving parks and protected areas?

- Please describe your knowledge of specific management frameworks and strategies.
- What concepts do you remember most from coursework related to parks and protected areas?
- What concepts do you remember most from coursework related to the specific management of parks and protected areas?
- What issues related to parks and protected areas are you aware of?
- What other courses have you taken, either in or outside your degree program not specifically related to parks and protected areas?
- Do you feel your academic program/curriculum etc. is missing anything? In other words, do you feel the program you are in could be improved upon? How?

The final section of the interview guide included operational questions in line with standard procedures related to improving the SSI process and experience (O'Leary, 2014):

About the questions and research

- What are some final comments or questions about the topics we have brought to this discussion?
- What did you like and dislike from this meeting?
- Do you have any suggestions for improving this process?

In line with the SSI process, questions were developed with the understanding that the agenda may change and adjustments may be required after each interview (Galetta, 2013). A completion time of thirty-minutes was estimated and conveyed to participants during the recruitment phase. Interviews were conducted via Zoom audio and participant consent was given to record interviews for transcription purposes. This study has been reviewed by the

Institutional Review Board (IRB) at Kansas State University (Proposal Numner 10068) and has been deemed exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects (**45 CFR §46.101, paragraph b, category: 2, subsection: ii**).

Coding and Analysis

Interviews were transcribed through a third-party transcription service. While this option can be costly and relies on the effectiveness of the transcriber, it can save time and avoid the researcher losing enthusiasm in the process precisely because transcription is so time-consuming (Seidman, 2019). Interviews were transcribed verbatim for completeness of information (McIntosh & Monroe, 2015). Given the benefits of iterative data collection and analysis in qualitative research (Creswell, 2014), interview transcription was ongoing and, when appropriate, additional questions were added to the interview protocol for proceeding interviews. Qualitative content analysis was conducted via an inductive coding approach to the interview transcripts. A goal of content analysis is "to provide knowledge and understanding of the phenomenon under study" (Downee-Wamboldt, 1992, pg. 314). This addressed the needs of this investigation, as the primary goal of this study was to understand if and how assumptions are being perpetuated in higher education classrooms of recreation-related majors.

In vivo coding was conducted, a first cycle coding method in which themes were derived from the transcripts themselves (Table 4.1). This method of coding, also known as verbatim or natural coding (Saldaña, 2016), helps the researcher understand main ideas, and the aforementioned phenomenon being studied, while respecting the voices of the participants (Manning, 2017). This approach also helps minimize researcher bias, which can be inherent in

qualitative studies, as well as through the process of asking open ended questions and asking non-leading questions (Ranney et al, 2015).

Table 4.1 Example of in vivo, first cycle coding results. Participants were asked about their overall experience in their respective recreation-related major.

Participant responses	Coding results
"…it's been [1]really awesome. My [2]advisor has been incredible. I was communicating with her before I even decided to enter the program. She's been so helpful just telling me what the expectations are and what I need to do in order to accomplish my own goals. I think a big difference from my original degree…I never felt like my advisor was working for me. …when I switched, my advisor was like, "What are your goals? How do we achieve them?" I loved that. All of my professors are the same way. They said, "We recognize your effort, we will work with you on what you want to do." I feel it's very [3]tailored to everyone's own experience.	1 "really awesome" 2 "advisor has been incredible" 3 "tailored to everyone's own experience"
"Everyone is super nice and [1]understanding and they really care about [2]making sure that we succeed as students. That's been really helpful to get all of this [3]hands-on training but [4]making sure that we're actually understanding what we're learning."	1 "everyone is understanding" 2 "making sure that we succeed as students" 3 "hands-on training" 4 "making sure that we're actually understanding what we're learning."
"[1]The teachers, most of them are super passionate. They genuinely love their job, and they do everything they can to [2]help you succeed in a really great way."	1 "teachers are super passionate" 2 "help you succeed"

Second-cycle coding was conducted using axial coding, in which resulting first-cycle codes were categorized to better understand the more dominant themes (Boieje, 2010). This method of coding is appropriate for use with a diversity of data types (e.g. interview transcripts) and helps narrow down the many codes developed from the first-cycle coding process (Saldaña, 2016; Figure 4.1).

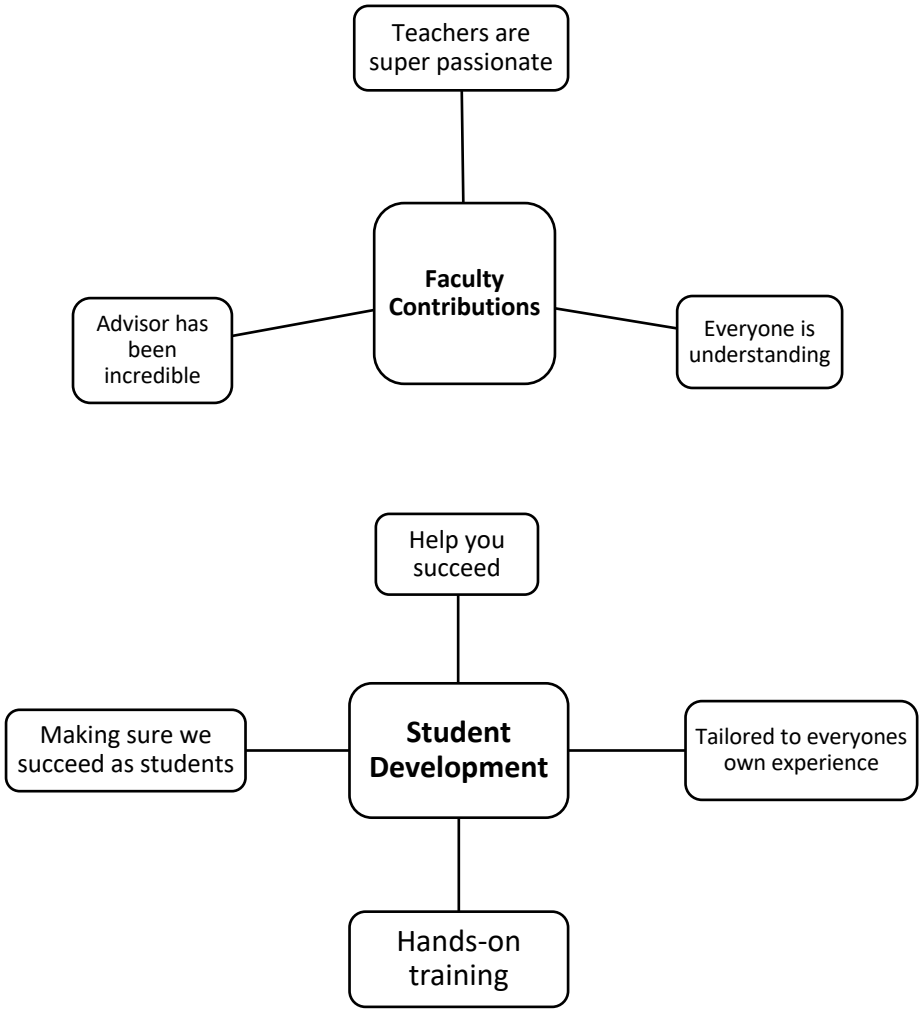

Figure 4.1 Example of two axial codes and their related categories. Based on participant responses of overall experience with their respective recreation-related major.

From these two different, yet connected, coding processes, dominant themes were gleaned from the interviews. These themes, consistent with other qualitative processes, include both a range of descriptive categories as well as interpretive elements of the topic(s) under investigation (Green et al, 2007). The results that follow highlight these dominant themes and their subcodes and address both the primary research question as well as the unexpected themes and topics mentioned by Young et al (2018).

Limitations

Further research involving the investigation of, and how, assumptions are transferred to students in recreation-related fields, as well as examining the other topics brought forth, would benefit greatly by expanding the reach of this study to more universities and students, as well as to graduate students. Even at a small scale, duplicating this process with graduate students in recreation-related fields would shed light on different aspects of not only their education process but their preconceived notions and beliefs as well. If nothing else, perhaps graduate students would have had a more defined idea of what professional path they were embarking on (i.e. researcher, park manager/planner, etc.). While this study yielded rich and valuable qualitative data, the fact that only undergraduate students were interviewed did limit the scope of the study's purpose.

Secondly, the ideal sample population would have been students of the VUM experts who participated in the Delphi study carried out in Chapter Two. In this way, a direct relationship could have been made between the origins of the VUM assumptions and the thoughts of the students who are being educated by those experts.

Lastly, limitations exist in the interview process itself. Being a novice, the researcher may have missed opportunities in asking additional follow-up questions, yielding a richer dataset to interpret. The researcher also recognizes that many of the main points in the discussion and conclusion could be considered assumptions in and of themselves and that, despite every effort to minimize researcher bias, there remains opportunities for implicit bias to influence interpretation of the results.

Results

Nineteen undergraduates from five, four-year, universities participated in the SSI, all of which were students in distinct recreation-related majors at their respective university or were involved with recreation-related coursework. Six participants were juniors and thirteen were seniors. Table 4.3 sums up the various colleges, departments, and programs of the participants. All programs fell into two general categories of agriculture and forestry related Colleges or health sciences and human behavior related Colleges. Only one participant was in a distinct College, yet still took recreation-related coursework that discussed aspects of VUM.

*Table 4.2 Breakdown of academic college, department, and program of participants in the recreation-related discipline. Added total number of programs indicate overlap between program names. *Denotes double major. †Participant in Design and Planning related College.*

		Agriculture or Forestry Related College *(n=11)*	Health Sciences and Human Behavior Related College *(n=7)*
Programs/Concentrations	*Natural Resource Related*	4	4
	Parks & Recreation Management Related	5	5
	Forestry Related		1

Conservation Related	10		2
Wildlife Related	3		
Event Planning Related			1*
Tourism & Resorts Related			1*
Sustainability Related		1 †	

The following results highlight emergent themes from the transcription and coding process and use direct quotes that reflect the unique and individual experience of each participant. This process, which used an inductive approach, followed the steps laid out by Elo and Kyngäs (2008) and is in line with narrative accounts of qualitative research data (Slone, 2009; Ranney et al, 2015). It is important to note that results from these SSI yielded little data to fully answer the original research questions. Nevertheless, participant responses yielded beneficial information related to the overall educational process of recreation-related majors, acting as an example of the progressive nature of qualitative research described by Diefenbach (2009). The following results also underscore the fact that often, "…patterns and concepts may emerge that were not foreshadowed but that are, nevertheless, important aspects to consider" (White & Marsh, 2006).

Visitor Use Management Assumptions in the Classroom

Overall, results from SSI did not provide ample evidence that VUM assumptions identified in previous research were being promulgated in the recreation-related classrooms of the participants interviewed. However, it should be noted that just because students did not make statements alluding to said assumptions does not mean they are not present. There are other factors to consider which are addressed in the discussion of this chapter.

To understand if, and how, VUM assumptions are present in recreation-related majors, participants were asked what issues or problems they believe exist in PPA, as well as what themes or main points were retained from their coursework related to PPA. Broadly speaking, five main themes emerged from the second-cycle coding process regarding issues and/or problems in PPA: cultural impacts, social impacts, ecological impacts, lack of education, and general management aspects (Table 4.3). Furthermore, participants were asked about what coursework was completed as well as what major themes or topics were retained from those courses (Tables 4.4 and 4.5). This was done to not only highlight the extent of coursework in these majors that touch on aspects of PPA, but also to provide more context into whether assumptions are being transferred to the courses in the form of main ideas or topics. And while no substantial evidence was provided that any assumptions from Chapter Two were present in participants' coursework, results nonetheless yielded noteworthy observations.

Table 4.3 Perceived problems and issues in parks and protected areas by students in recreation-related majors.

Main Codes	Sub-codes	Frequency(n=19)
Cultural Impacts		1
	Respecting cultural or historical aspects	1
Social Impacts/Issues		2
	How to manage people in general	4
	Overcrowding	8
	People's values are really different	2
	Not many Black people or Hispanic people go outdoors	1
	Controlling inconsiderate people	2
Ecological Impacts		1
	Impacts to wildlife	2
	Climate change	1
	General degradation of environment	5
	Water Pollution	1
	Invasive Species	2

Lack of Education		
	Misuse	1
	Lack of engagement from community	1
	Lack of outdoor education	1
	Kids these days are not going outside	1
General Management	Lack of funding	6
	Misinformed managers	1
	Stretching park resources too thin	3
	General mismanagement	2

Previous research from Chapter Two indicates that one assumption of VUM is that a strong relationship between the amount of visitor use, crowding and conflict exist. While data presented in this study shows little support that assumptions are passed forward in the classroom, there are exceptions. For instance, one student indicated that "…broadly we learn a lot about the difference between direct and indirect approaches to user problems, so we talk a lot about overcrowding and conflict, visitor use impacts in ecological, social and economic approach" [Senior; Recreation management].

However, the number of statements made related to managerial aspects of PPA was notable. For example, many of the statements made regarding problems that participants believe exist in PPAs focus more on management approaches of said areas. Whether its "misinformed park managers…that maybe don't know the right methods of going through everything" [Senior; Sustainability], managers that "ignore the aspects of the recreation opportunities and the reasons why people are actually coming to the park" [Junior; Natural resources], or aspects of the parks being underfunded, it is evident that overall mismanagement of PPA in some form is being discussed in classrooms.

What is also noteworthy about these comments is that they highlight a unique implication related to an assumption discussed in Chapter Two – *Research influences management decisions*.

Whether or not VUM research actually *does* influence management decisions, comments like the ones above indicate a potential need for a greater understanding of the application of research in PPA management. Yet, as previously stated, none of the data suggests a large-scale transference of any of the identified assumptions to students in recreation-related majors. That being said, the interviews yielded additional and noteworthy information that should not be overlooked when it comes to the overall teaching and learning outcomes of these majors and programs. This review of alternative topics and themes, not directly related to the primary research questions, illustrates the non-linear nature of this qualitative approach (Elo & Kyngäs, 2008) as well as highlights the benefits this method allows in providing participants "…freedom to explain their thoughts and to highlight areas of particular interest and expertise that they felt they had…" (Horton et al, 2004).

Cultural Impacts

Despite only two specific references of cultural impacts in PPA, it does represent the inclusion of a broad incorporation of possible impacts that can occur across these landscapes. These mentions of cultural impacts came from students of different recreation-related focuses, and one specifically mentioned their environmental science classes incorporated cultural and historical resources as important talking points, providing evidence of the positive aspects of an interdisciplinary approach. "We talked about protecting cultural resources just a couple weeks ago. I think that's something that I've noticed in the back of my head, but it just came to light recently, just like respecting the cultural and historical aspects of parks and protected areas" [Senior, Recreation management]. The other participant responded that what they took away from the cultural impacts is that it they are "causing us to basically have less and less areas for recreation" [Junior; Tourism and resorts, Event planning]. Both statements highlight the positive

role instruction can play in connecting students' thoughts and ideas to real world examples, both on a personal as well as practical level.

Social Impacts

Overcrowding was the most referenced social-related issue, yet still only represented 42% of respondents. Many of the statements made were general in nature and did not elaborate on any specific problems or issues. For example, one participant made the blanket statement that "there's always problems like whether it's overcrowding or too much trash and litter at the park…" [Junior; Natural resources]. While comments like this spoke to the fact that these more visible issues are being brought up in classrooms, it was other comments that spoke to those social issues that may often go overlooked or are perhaps only now gathering more attention. Statements such as the following from a senior:

> "My instructor, he showed me information, or data, I should say, of polls and surveys, and he noticed that not many Black people or Hispanic people go outdoors and really do recreational activities out in the outdoors, and I feel that could be a problem, just because I know when people are managing for those areas, they're not necessarily trying to divide people up or just gear toward specific type of person, it's welcoming for all. I think, just bring out a way to include everybody, it's kind of a big problem."
>
> Senior; Natural resources

This was just one of two statements, out of nineteen interviews, that referenced issues of diversity or inclusiveness in PPAs. Equally unique were comments made that alluded to visitor values, hinting at the often-subjective nature of the VUM field and the fact that "…people's values are really different and that's a really hard thing to try to toe that line to make it [access vs impacts] to make it acceptable on both sides" [Senior; Wildlife ecology, Conservation]. This subjectiveness was further highlighted by the same participant when they pointed to the importance of "how people perceive certain things that happen within parks…" Despite these aspects not being heavily referenced, the very mention of them indicates that these thoughts and ideas are being shared in some fashion within recreation-related majors in this study.

Lack of Education and Awareness

While not the most referenced issue, the fact that participants highlighted, in their opinion, an overall lack of education and awareness among park visitors speaks to at least a partial recognition of the root of many issues and conflicts within PPA. Participants referenced "a lack of outdoor education" and visitors "accidentally using them [PPA] improperly or accidentally harming the environment when they're not intending to" [Senior; Natural resources].

Participants also had noteworthy comments in relation to how visitors perceive or understand PPA, further alluding to an opportunity to improve educational aspects of these areas and experiences. Many participants pointed out that what often contributes to visitor experiences is not only how those landscapes and PPAs are presented but also how individual and unique backgrounds influence their experience. For example, participants made note of how there is "…not enough visible understanding of what the park is doing to have those conservation

aspects" [Senior; Parks, Conservation] and that "…we could have a better culture surrounding the outdoors, at least in the United States" [Junior; Forestry]. The following statement particularly stood out as one that spoke to how potential impacts affect the longevity and legacy of these natural areas:

> "I guess how I should put it is, preservation of the visitor experience. All these parks you go to, they're a certain way right now and they all offer certain things, but maybe in 20 years from just the vast amount of people that have visited the place, and either affected it poorly or affected it better, that's going to have an effect on that place and the ability for future people to visit that place and experience something meaningful at that place…"
>
> Senior; Natural resources

This last statement is particularly poignant and speaks to more than simply any issues or problems in PPA. How *will* these landscapes, along with the visitor experience, change in the next twenty years? Furthermore, even with all the problems and issues believed to be present within PPA, opportunities were mentioned as well. Mentions of "community empowerment" and opportunities to promote "inclusiveness and…representation and shared management with indigenous communities" [Senior; Parks, Conservation] underscore the fact that despite all the discussion surrounding problems and issues in these areas, there are opportunities for growth to be found and prospects for improving both the visitors experience as well as "conserving the natural resources" [Senior; Wildlife ecology, Conservation] at the same time.

Table 4.4 Courses that discussed aspects of parks and protected areas taken by participants.

Main Codes	Sub-codes	Frequency(n=19)
Parks, Recreation, & Tourism		2
	Heritage tourism	1
	Outdoor recreation	2
	Recreation resource management	1
	Park planning	1
	Ecotourism	4
	Camp counselor	1
Wildlife & Natural Resources		
	Wildlife techniques	1
	Wildlife management	2
	Landscapes	1
	Natural resource-based tourism	1
	Natural resource management	3
Education & Interpretation		
	Leave No Trace	2
	Interpretation	3
	Environmental/outdoor education	2
Management Aspects		
	Policy and regulations	4
	Visitor use management	3
	Managing agencies	3
	Management strategies and frameworks	2
Natural Sciences		
	Conservation biology	1
	Geography of parks and protected areas	1

To better understand the variety of coursework offered to undergraduates in recreation-related programs that discuss aspects of PPAs, participants were asked to share what classes they had taken or are currently taking. This helped gain a greater understanding of how many opportunities existed for PPA concepts and themes to be discussed, as well as to see if any assumptions were pervasive within these topics. While 100% of participants had taken, or were currently taking, such classes, there was a wide breadth of subjects that discussed aspects of PPAs.

For example, 58% of respondents mentioned characteristics of PPAs were discussed in parks, recreation or tourism related classes while 37% noted that environmental education and/or environmental interpretation courses touched on aspects of PPAs. Similarly, 42% noted that wildlife and natural resource-based classes (e.g. natural resource management, wildlife management) discussed PPA concepts. Courses related to management-specific contexts made up the largest percentage of responses (63%), while only 11% of participants mentioned courses specific to the natural sciences (e.g. biology, geography) as sources of information for PPA.

The amount of depth covering topics related to PPAs varied as well, with some comments making mention of having only "…one or two full days of lecture just on parks and protected areas" compared to taking "…a course specifically on [a specific national park system]. I went down there for a week as part of that course…" [Senior; Wildlife ecology, Conservation]. Immersive learning opportunities was echoed by another student who mentioned that, as a part of their interpretive learning class, they "…got a tour of [a park]…and then we actually worked on it, and we helped them with whatever they needed…" [Senior; Natural resources].

An emphasis on experiential learning, fieldwork, and internships was mentioned by others as well. This underscores the role these hands-on experiences have within the recreation-related field and also highlights the multi-faceted nature of the discipline, as the following comment alludes to:

> "My first internship that I did with parks and rec, I actually just did it, MWR [Morale, Welfare and Recreation] over at [an army depot]. It was really great. I did a little bit of event planning. It

wasn't anything natural resource, but it did give me a sense of how to plan different events. I know no matter where you go in parks and rec, you're going to have to plan something. Then, my second internship was with the Corps of Engineers... I got a good gig there and I shadowed the park rangers. I did pollination plants. I planted all those. I patrolled with the park rangers, whether that was in the truck, on the campgrounds, or on the boat looking for expired tags and stuff like that."

Senior; Natural resources

This statement was a rare example of opportunities that were not strictly relegated to only one responsibility or concentration. With outdoor recreation and VUM incorporating so many different aspects, exposure to a variety of experiences can be important at this stage for students to get a broad and varied perspective of the discipline and associated components.

Table 4.5 Participant retained themes and major concepts related to parks and protected areas.

Main Codes	Sub-codes	Frequency(n=19)
PPA Impacts/Issues		
	Social impacts	4
	Ecological impacts	2
	Overcrowding	1
	Trail impacts	1
General Management Aspects		
	Include all stakeholders	1
	General maintenance	1
	Conservation vs preservation of areas	6
	Zoning for recreation	1
	Different land management agencies	8
	Policy and legislation	4
Education & Interpretation		

	Educating the public	3
	Interpretive learning aspects	4
Visitor Perceptions & Values		
	Sense of place	1
	Visitor happiness	1
	Emotional connection to parks	1
	Importance of parks	1

Overall, the foremost topics and concepts related to PPA that participants retained from recreation-related coursework dealt with four themes: PPA impacts (e.g. social, ecological), general management of PPAs, education and interpretation, and visitor perceptions and values.

Parks and protected area impacts and issues

Distinct from the direct question related to PPA issues and problems, the potential impacts and associated problems often dealt with in PPA were brought up several times throughout the interviews as overall themes and concepts that participants remembered from their coursework and instruction. However, similar thoughts were raised, such as aspects of overcrowding and the negative ecological impacts that can occur in these areas. Statements related to the ecological consequences of litter and trail impacts, such as one participant who mentioned that his professor "…went crazy about orange peels…not to throw orange peels, because you think that they're just going to disintegrate but they actually don't…" and basic mentions of how "…different tread sizes for trails…" [Senior; Sustainability] is an important consideration when it comes to managing trails in PPA.

General management aspects

Broad general comments about management of PPAs was brought up by many, with the majority of comments related to how different agencies manage their respective areas in different

and distinct ways. However, these were very high level in nature, with very little in the way of specificity mentioned. Many comments made were similar to the following, in which one participant mentioned that "…we talked about a lot of the different acronyms of, I guess, different agencies and stuff like the National Park Service… tried to dip our toes into all of those [agencies]…" [Senior; Natural resources]. Other comments were more targeted, such as one participant who made reference to the idea that "…depending on the political climate of the time the government-run agencies are always up in the air if they'll get funding or not…which causes like right now there's a big backlog of maintenance within all those agencies…" [Junior; Parks, Conservation].

Also noteworthy were comments made regarding the difficulty PPA managers often face regarding the concepts of preservation and conservation. This was something multiple participants made specific reference to, such as one who stated that "…the big thing, especially the earlier class to talk about is the idea of preservation versus conservation. We've talked a lot in classes about how is it truly possible to preserve something or can you only try to conserve it? That was a big thing in the early classes…" [Junior; Parks, Conservation]. This concept in particular highlights the implications that the instruction of future managers has on this issue.

Education and interpretation

Targeted comments were also made about interpretive and educational components retained, further highlighting the role these aspects play in other aspects of PPA. One participant mentioned that they remembered "…mostly the interpretive, interactive aspects…facilitating activities, and planning those and consolidating those activities in a way to have a lesson at the

end to make the participant learn something about either themselves or about the resource" [Senior; Natural resources].

The educational aspects of PPA management was also highlighted by another student, who stated that "I think to me the most interesting one and the one that I liked the most was educating the public about different things that they can do to better the lands" [Senior; Sustainability]. While there is a certain level of subjectivity to the idea of what constitutes "bettering" the land, these statements allude to the important role that education and interpretive elements may play in VUM aspects and in the overall management of PPA. If nothing else, it is noteworthy that a number of students are retaining these aspects from their coursework.

Visitor perceptions and values

Individual values and perceptions were brought up again as retained themes from coursework by several participants, some of which were made by the same participants who cited personal values as potential issues and challenges in PPA. However, these comments were rooted more in emotional and personal connections to natural areas, such as the following comment:

> "… park planning and the sense of place that he [the professor] kept on hammering home, and just creating a sense of, what was the word? I just read a paper that clearly put it in terms that I loved. Not a sense of relevancy, it is but it isn't. A concept of the spirit of the place to the visitor that really has an emotional connection with them. I don't know if I'll ever be planning the

> physical structure of a park, but I feel like a sense of place definitely goes beyond that and you can create a sense of place just through, or more of a sense of place or less of a sense of place just how the park is managed."
>
> Senior; Parks, Conservation

This comment in particular underscores the fact that the emotional and personal connections that can occur in PPA around the U.S. should not be overlooked, particularly when they influence an individual's behavior and experience in those areas. And while numerous comments share commonalities with many of the assumptions identified in Chapter Two, these references alone did not provide enough evidence to surmise that they are drastically impacting the education and thought processes within these majors.

Once the main research objective concerning the presence of VUM assumptions was addressed, it was beneficial to investigate some of the responses as they provided additional understanding into the student experience within recreation-related majors. The following results, while not directly linked to the study of assumptions in VUM *do* provide valuable insight into why students are driven to pursue these majors, what students plan on doing *with* their degree, what major themes and topics related to PPA are being addressed, and an overall understanding of how these majors and programs are serving their students.

On influences in choosing recreation-related major

Overall, influences and factors in choosing a recreation-related majors centered on four main themes: childhood experiences, social aspects related to the major, work-related

experience, and general appreciation of the environment and/or outdoor recreation. Since childhood experiences are an important influence on outdoor recreation behavior and values (Manning, 2011; Yoesting & Christiansen, 1978), it was worthwhile to examine this characteristic.

Childhood Experiences

37% of participants mentioned involvement with some type of summer camp or outdoor organization as well as simply exploring the out-of-doors as a child. Responses were as specific as stating involvement and experiences with camps such as 4-H and Boy Scouts led to them wanting to do "something outdoors" [Senior; Natural resources] or broad in simply stating that exploring the natural world around their home influenced their decision to be pursue a recreation-related major. For some, these childhood experiences even led them to drastically change their career ambitions, as was the case for one participant when they stated that they "…for a long time wanted to be an astronaut, but then I got into Boy Scouts…Then I went to this camp called Outdoor Educational Laboratory, which kept the theme of nature going…the seed planted that I love nature was planted within those first year or those first few, where I was really understanding the world" [Junior; Parks, Conservation]. Statements like this underscore the value these childhood experiences can have on one's life, particularly when making influential life changes and even how one views the world around them.

Social Influences

Social aspects, such as family and/or friends going through the same major also played an important part of some of the participants' decision to enroll in a recreation-related major. "I had

an older sister who did it [the recreation-related major] …I ended up hearing a lot of the stuff that she was working on…I think I ended up getting hooked on more than she did…" [Senior; Parks, Conservation]. This sentiment was echoed by a participant who stated that "…my brother went through this program…I knew about this program and had other friends that had gone through it. That helped influence me to come here" [Junior; Parks, Conservation]. This familiarity with the program, whether it was familial or otherwise, in addition to being a factor in choosing a recreation-related major also speaks to the positive evaluations these programs receive from those who are involved.

Work-Related Experience

For some, it was outdoor-related work experience that helped motivate them to pursue an academic career in a recreation-related major or even a combination of childhood experiences and employment. What was interesting about these responses is that some previous work experience was more directly related to the recreation-related discipline with others, yet both found their place in said major at a later point in their academic careers. For example, one participant state that despite "working at summer camps and other outdoor education programs since…high school," they changed majors later in their academic career. Yet once they switched to a recreation-related major, "…it was perfect. I knew it was right where I needed to be" [Senior, Recreation management].

Similarly, one student "was a vet tech for 15 years" and "…started to have a real passion within working with wildlife" [Senior; Wildlife ecology, Conservation]. After studying in a zoo-related program for some time, they transferred to a different university to pursue the specific recreation-related program there and finding their niche.

General nature appreciation

A majority of participants (58%) simply stated that it was a love of the outdoors, wildlife, or parks that influenced their decision to pursue a recreation-related program. Responses highlighted aspects of spending "…a lot of time outside throughout my life…" and growing to "…love the outdoors and love what the outdoors can do for people, both through mental health and spiritual aspects" [Senior; Parks, Conservation] as well as simply aspiring to help "…save the environment in general" [Senior; Wildlife ecology, Conservation]. For some it was more basic, and simply reflected the fact they "…really like the outdoors…" and they "…just want to do a job that involves the outdoors. That's essentially it" [Junior, Forestry].

Plans for employment or continuing education

Participants were asked what, if any, their current plans were for continuing education or employment once they graduate. This had valuable implications for understanding who in these majors had any plans or aspirations on pursuing management-related positions, or positions that may involve, or influence, decision making processes within PPA. Major themes that appeared from responses included continuing on for a graduate degree in a recreation-related major, working in the public sector (e.g. federal agencies), or general employment in the outdoor recreation field until taking the next step (e.g. seasonal jobs; Table 4.6).

Table 4.6 Participant plans on employment or continuing education.

Main Codes	Sub-codes	Frequency(n=19)
Recreation-related Graduate Degree	Master's degree	5
Public Sector		1
	National Park Service	3

	US Forest Service	2
	Military	2
Recreation-related general employment	Invasive species work	1
	Outdoor guiding related	3
	Outdoor/environmental education	2
Other		
	Private sector	1
	Travel	2
	No plans	1

While no specific mentions of management ambitions were made, the fact that some references to conducting research were made shed light on implications assumptions VUM research methods could have on future PPA research practices. For example, one participant made leveled remarks about how much they "really enjoy research" related to PPA. Furthermore, the same student made comments about entrepreneurial interests involving developing their own "...conservation company that looks into buying land… Maybe, surface mining and quarry operations that have been abandoned and turning those into parks. There's been some success with that in California, and I think in the northwest. I'd like to essentially get lands for I guess, conservation easements and stuff like that, and while doing that, develop programs as an alternative to higher education" [Senior; Parks, Conservation].

Furthermore, some interest in public land policy does speak to the importance of ensuring unsubstantiated assumptions aren't being disseminated in higher education. As one participant stated "…learning that life sciences are honestly preferred somewhat by the park, but I'm also looking at environmental law. Potentially, I'd like to write policy for the National Park System" [Senior; Parks, Recreation]. Perhaps as equally influential as the managers themselves, understanding how future policy writers are instructed should also warrant consideration.

On specific parks and protected area management techniques

Participants were asked about specific PPA management techniques and strategies that came up in their respective recreation-related coursework and experiences. Most comments made about management aspects of PPAs were general in nature, with only a few of the participants mentioning specific management frameworks (e.g. Visitor Experience and Resource Protection (VERP), Recreation Opportunity Spectrum (ROS), Interagency Visitor Use Management Framework (IVUMF) or strategies (Table 4.7).

Table 4.7 Participant experience with parks and protected area management frameworks.

Main Codes	Sub-codes	Frequency(n=19)
Specific Frameworks & Strategies		
	Interagency Visitor Use Management Framework	5
	Recreation Opportunity Spectrum	4
	Visitor Experience and Resource Protection	2
	Limits of Acceptable Change	3
	Adaptive Resource Management	2
	Value-Based Management	2
	Benefits-Based Management	1
Framework Related		
	Indicators and thresholds	3
	Engage the community	1
	Different agency approaches	4
Other		
	National Environmental Policy Act	1
	Recreational Management	1

While the majority of comments made about specific management strategies and techniques learned in the classroom were general in comments, there were still a moderate number of references to specific frameworks. General statements included ones such as how there are "…different countries' takes on what national park means or what a protected area

means. Some are just stricter. Sometimes it's just a protected area. Nobody can do anything there. Sometimes it's open to some recreation. Sometimes it's open to exploitation…" [Senior; Wildlife ecology, Conservation].

Specific management frameworks and strategies

Others did touch specifically on actual management strategies and techniques, such as how one student recalled exploring "…some of the different types of management practices that are out there, being benefits-management, value-based management…and adaptive resource management…" [Junior; Parks, Conservation]. Other students were quick to mention other frameworks used, such the "…Recreation Opportunity Spectrum…none of the other frameworks are coming to mind, but all those acronyms like limited acceptable change [*sic*]. All those fun ones. I've had a couple of courses that have centered around those frameworks" [Senior; Recreation management].

This study tried to ascertain the level of knowledge, or at least recollection, regarding the Interagency Visitor Use Management Framework (IVUMF), which has recently become the codified approach to VUM across all federal agencies that manage public lands (IVUMC, 2016). However, very few students actually made specific note of the framework, even after being prodded if they remembered hearing about it or learning about it. However, some participants did mention learning about it, and even being involved with projects that focused on its application in real world scenarios. Comments such as the following, where one student mentioned "…really diving in the IVUMF and having a project…where we have to go and actually complete an IVUMF evaluation at [local natural area] using indicators and thresholds…" [Junior; Parks, Conservation].

While perhaps it should not be an expectation that every single recreation-related class discusses specific management strategies such as the ROS or IVUMF, the apparent dearth of a basic knowledge or recognition of these strategies does call attention to a potential gap in PPA education. For instance, only two students specifically mentioned VERP, three mentions of Limits of Acceptable Change (LAC) occurred, four students noted learning about ROS, and five students mentioned the IVUMF. The fact that only 26% of participants noted learning about the IVUMF – now the codified land management framework across all federally owned land – further points to a possible paucity of discussions surrounding past and current PPA management strategies.

On general coursework taken by participants

To get an idea of the breadth of educational experiences students in recreation-related majors were gaining, participants were asked about other courses they took both as part of their major program or as general university requirements. Outside of university requirements (e.g. math and statistics, biology and chemistry, English) many respondents opted into a variety of other humanities, natural and social sciences and fine arts classes.

Specifically associated with participants' respective recreation-related majors, four themes of classes emerged: natural resource-based classes, recreation, leisure, and tourism, education and interpretation, and policy classes. Natural resource-based classes received six distinct mentions, and included courses such as water recreation management, natural resource ethics, society and natural resources, and natural resources and conservation.

From the recreation, leisure, and tourism standpoint, eight distinct courses were mentioned and included therapeutic recreation, adventure programming, parks and recreation

programming, introduction to outdoor recreation, park maintenance, and tourism and management.

Five references of education and interpretation courses were made in addition to specific mentions of programs such as the Project Learning Tree environmental education program. References were also made to courses specific to outdoor leadership and education.

Lastly, four mentions of courses related to environmental law, policy, and assessment were highlighted. Despite having the fewest references, these courses nonetheless illustrate the range of topics and subject matter that are not only present within certain recreation-related majors but also underscore the interdisciplinary nature of the discipline. This was supported by some of the comments made. As one participant stated, "I found it [an anthropology course] to be a very interesting class because a lot of the topics that I've learned through my [recreation-related major] classes, I can relate and have a different perspective on some of the issues that we talk about in the class and vice versa" [Junior; Parks, Conservation].

Even with classes that were part of ones major before switching to a recreation-related major, there were interdisciplinary benefits highlighted such as a comment from one participant who stated that, "I think, having that fire science background, we didn't necessarily only talk about fire when we talked about risk management in all my fire science classes as well. Having that background knowledge helped a lot when thinking about risk management in terms of recreation" [Senior; Natural resources].

On missing elements of participants' respective recreation-related major

Participants were also asked if they felt their program was missing anything. Responses varied and in fact, many participants stated that there was nothing that they could think of that

they would change, or wish was different, and had nothing but praise for their program. "…I honestly think they're one of the best majors at [university] because their department head… is probably one of the best professors I've ever had. Related almost everything in his class to real life. All this stuff I just learned from him. Then just the process itself, like I told you earlier, how they're super hands-on, super geared towards actually gaining experience in that field" [Senior; Natural resources]. This particular comment speaks directly to the role faculty and instruction play in students' experience within this discipline.

Further praise was given by other comments, such as from one participant who stated that they have "…been really happy with [recreation-related major] program. It felt like being a park and rec student, we went through a very different school than kids in a different major or something like engineering or something. I think that difference in culture… I really think that the difference in community and the difference in culture is perhaps our greatest strength" [Senior; Parks, Conservation].

Despite the positive statements, there were some comments related to aspects participants would have liked to have seen changed or offered in the approach to the curriculum or course offerings. Improvements such as incorporating more aspects of conservation as "…a lot of the classes currently focus more on the management side…the more municipality section of it. I wish there would be more conservation-focused classes..." [Junior; Parks, Conservation]. Additional changes to curriculum were mentioned, as one participant mentioned that they desired "…some degree of education, like outdoor education curriculum, was required for the degree…" [Senior; Recreation management]. Also, a desire for a more streamlined approach to courses was expressed by one participant, who felt like many of their courses "…are a little bit separated in terms of the way they talk about things. I wish that the program was more all in line with each

other, that everything would speak to itself and kind of interconnect in a way" [Senior; Natural resources].

It was also noteworthy to hear some comments that were dependent on the focus on the student. For example, a senior who was more wildlife centered within their recreation-related major had the following to say:

> "I think that it definitely lets you get away from the human aspects. I've only really taken like two human, more based courses, and they're required. Adding in a little bit more of the human part would be really beneficial to us because I know a lot of people get into this major to get away from people. Once you actually get out into the job, you have to talk to people constantly, you have to advocate for funding and all kind of stuff. I think getting those skills early and learning how to deal with the public and policymakers and stuff is really important."
>
> Senior; Wildlife ecology, Conservation

Alternately, a junior who is more natural resource orientated commented on the following: "I think it could improve upon its recreation courses. Right now there's only one that they offer. If we added more, that'd be a lot more useful, because I know me and others are more interested in going into the human dimensions of natural resources instead of the forestry department of it" [Junior, Natural Resources]. Both of these comments underscore how more

investigation into more of an interdisciplinary approach to these majors could benefit the student learning experience.

Impact of COVID-19 and remote learning

As per the design process of SSI, opportunities arose for additional questions to be asked outside of the designated questions established by the interviewer. One such question that generated noteworthy responses dealt with the impact the COVID-19 pandemic had on participants' experience within their major and their experiences with remote learning.

Not surprisingly, the disruption of student experiences in recreation-related majors caused by the pandemic was noticeable. These disruptions included fewer opportunities for in-person experiences and hands-on learning opportunities and field excursions, as well as the outright cancellation of many activities and events that typically occur. While one participant mentioned that having online classes was somewhat "easier", they were quick to point out that they felt they were "…missing out." The same participant went on to explain that they "…feel like I don't really -What is it? There's a certain fulfillment you get from going outside, and it's not just how enjoyable it is, it's just more you feel like you did something that day. These online courses, you don't feel as much as if you're like, "Oh, I went outside for hours today, I'm all sweaty. I feel like I got something done today." You don't really feel that same sense of accomplishment, I guess" [Senior; Forestry].

Challenges were also mentioned related to limited experiential opportunities, something that many participants pointed out as important components of their experience. "It's been really difficult, especially for such a hands-on major…" [Senior; Wildlife ecology, Conservation]. This was echoed by another participant who stated that "In one of my classes… you're missing

out on talking to people in the field and going out to sites to assess what kind of planning and design to use. Definitely missing out on site visits. Because I switched degrees so late personally I haven't met anyone in my degree face-to-face, so definitely missing out on the social aspect, which is huge for me" [Senior; Recreation management].

It was also interesting to have students mention how faculty interactions and capabilities played into their experience during time spent learning remotely. In addition to the nature and delivery of the course itself, participants also pointed out how it was largely dependent on the individual instructor. For example, one participant made note of how certain classes "…have really been poorly impacted. It's really highly dependent on the instructor and how technologically adept they are. Spring semester [2020], it was real rough" [Senior; Wildlife ecology, Conservation]. This participant went on to speak specifically about missing opportunities related to conversing with, and using for support, faculty members in between classes and informally in the halls and office "[before COVID]…when I would finish a class, if there was something I didn't understand, I would just ask the professor…[during COVID], you can't just pop in at their office and hang out for an hour and chit-chat. You have to schedule a Zoom meeting. Even in the Zoom meetings, you still don't get that focus from the professor, and really helping you navigate what your problem is."

Lastly, it is important to make note of the physical, mental, and emotional toll that some participants faced, alluding to the collateral impacts that the pandemic may cause among students. One participant in particular made very poignant comments about how the situation, and the resulting instructional changes, impacted their experience.

"It definitely impacted me a lot because of my disability. At first…

> I didn’t have closed captioning. I had to deal with notes. I had to ask for notes and especially with international teachers. The accent is really strong and I just, I just teach myself how to do these concepts and everything. That was really hard…but it wasn't until this semester I actually got to have captioning and that's been really helpful. But it has been emotionally and physically exhausting me because of reading fatigue because I have to look back and forth, write captions, and then slides so that really affected me because I just did not want to do I didn't want to learn anymore because it was just too overwhelming. Over the summer, when I was taking my practicum I was working in Wyoming. It was hard because people wear masks, and I couldn’t read lips…Just based on my disability, COVID has been really hard for me, and now often people really realize that it's literally my worst nightmare come true.”
>
> Senior; Parks, Conservation

Comments such as this speak to a need to ensure that adequate learning opportunities and systems are in place to support learning at any point, not only during pandemics. Many of the implications this statement alone has regarding how higher education institutions can support students in difficult times is outside the scope of this study. Yet, it does emphasize how a general awareness of different student experiences, and even disabilities, impact the learning experience and how recreation-related majors and programs can respond accordingly.

Discussion

This study sought to determine whether any of the VUM related assumptions presented in Chapter Two were trickling down into recreation-related majors in higher education. In other words, I wanted to establish whether or not these assumptions were being unduly embedded in coursework of future PPA managers and researchers. However, based on conversations with students in a variety of recreation-related majors at various universities, it appears that no such sweeping, explicit, transference of assumptions is happening within the majors of students interviewed. However, despite the lack of evidence to comprehensively address the primary research question, noteworthy information was uncovered nonetheless through the flexible nature of SSIs.

While there were mentions of PPA issues or problems that could be connected to some of the assumptions brought forth in Chapter Two, the recognition of said issues does not translate to any kind of indoctrination of said assumptions. For example, only 15% of respondents specifically mentioned "overcrowding" as a problem within PPA. Yet despite this acknowledgement that crowding is often a cited problem within many PPAs, the associated comments made did, in no way, insinuate a direct relationship between the number of visitors in each area and the level of crowding or conflict. Simply stating an issue, that does in fact exist in various PPA around the U.S. in some form or another, should not be taken to suppose that there is an abundance of deceptive information being proliferated to future PPA managers, researchers, and recreation planners. Taking this into consideration, more questions are raised; would students in recreation-related majors even recognize negatively influencing assumptions being presented in the first place? What of the role of implicit bias and preconceived notions? Or,

have students even acquired the necessary knowledge to recognize assumptions when they are presented?

These queries highlight the role instruction and dissemination of material plays within these majors, whether they address aspects of VUM or not. In other words, would students in recreation-related majors even recognize various assumptions on their own, or would they need their instructor to point them out to them? This suggests that changes are required at the instructional level, that is if the instructor themselves are not aware of the assumptions they may be presenting to their students. Perhaps what is needed are actually efforts to promote not just a recognition of these assumptions, but a *promotion* of them of sorts. Underscoring the very fact that they are assumptions and that they can exist to some degree. As a result, future park managers, recreation planners, and policy writers can go out into the world being better prepared to recognize and account for those assumptions.

Additionally, resulting data highlighted some additional areas of interest that have important implications for how recreation-related majors function; namely evaluating the interdisciplinary nature of said majors as well as how these programs, and the faculty that teach the classes therein, can adapt to the changing needs of students.

Henderson et al (2009) suggests that students who choose a recreation-related major already have a specific goal in mind post-college, such as becoming a park ranger or recreation therapist. The authors go on to question the role of specialization in recreation-related fields and question whether *too much* specialization causes students to miss the broader purpose of recreation services. With outdoor recreation studies, and VUM as a byproduct, being the interdisciplinary course of study that it is, it becomes crucial that the educational systems in place related to parks, recreation, and tourism management are effectively and adequately

preparing the next generation of PPA managers to avoid the aforementioned level of specialization or, specifically related to this study, undue influence of assumptions related to VUM. Results from this study indicate that these assumptions are not inherently present in the recreation-related classes that were sampled, however, as previously mentioned it is important to recognize the role instruction itself plays.

Something that is frequently mentioned in the research process, bias and influence from preconceived notions can also have a variety of impacts in the classroom as well (Boysen et al, 2009). Gone unrecognized, biases, assumptions, and unsubstantiated preconceived notions may precisely influence the views and beliefs of future PPA managers. For example, it is one thing to address aspects of crowding in parks and other natural areas, but another to precondition students to think that crowding is an inherent problem in these areas and always leads to conflict. It is the responsibility of the instructor to ensure that objective, current, and valid facts are being promulgated in the classroom, free of bias and undue assumptions. Facts that reflect the dynamic nature of this discipline and despite the fact that many aspects of VUM are actually quite subjective.

Furthermore, results suggest interesting instructional differences between programs. For example when asked about specific management techniques and frameworks, students in wildlife concentrations were more general in their responses than their counterparts in natural resource based or parks and conservation related programs. Students in the latter concentrations were more easily able to recall specific management frameworks, such as the IVUMF. This underscores the discrepancy between concentrations and programs that, while unique, share similar programmatic goals and whose students may still go on to have similar influence on PPA management decisions.

It is also worth noting that participating students, for the most part, did not mention specific positions or jobs they were seeking upon graduation such as interpretive park ranger or outdoor recreation planner, contrary to the position of Henderson et al (2009). Quite the opposite, for those not seeking graduate studies, participant career ambitions were general and even vague to some extent. Granted, these interviews represented only a fraction of the undergraduate population in recreation-related majors across the U.S.. Conclusions cannot, and should not, be taken to characterize every single undergraduate student in these associated majors. The question should then be, what exactly is the purpose of undergraduate recreation-related programs? Is it to prepare them for a specific job? Provide them with critical thinking skills? Discuss themes and subjects from a variety of backgrounds and perspectives to highlight the importance of diverse and varied viewpoints? All the above?

Several participants stated that, of all the things they wished were different within their respective program, they cited a desire for more learning opportunities that discussed alternate, yet associated, concepts. An availability of additional courses that explored different perspectives yet were connected to the major themes and topics within their own concentration. It is noteworthy that students more involved with wildlife and/or natural resource concentrations stated that they wished more courses discussing aspects of outdoor recreation or the human dimensions of natural resource protection were offered, while those students being in a more recreation or park management-oriented concentration mentioned a desire for more courses related to conservation and the natural resource field. Each concentration was lacking what the other could provide. This suggests an opportunity to be had in the form of targeted curriculum changes within recreation-related majors. And while not directly related to the research objective regarding VUM assumptions, it does have important implications for the

interdisciplinary nature, or lack thereof, of recreation-related careers that directly influence the decision making process in PPA. If nothing else, continued research on this matter would help shed further light on this idea and be beneficial to improving these programs in universities across the U.S., and benefit the future management of PPA as a result.

If the aforementioned merits of an interdisciplinary education are well founded, then universities, college, and academic departments should make every attempt to ensure that the education and coursework provided is meeting not only the needs of the student but the needs of the profession as well. This goes beyond general education requirements such as math and statistics, English, psychology, and other courses not directly tied to one's major. Yes, these courses are important and beneficial for reasons of their own, yet it is equally important to promote an interdisciplinary, and even multidisciplinary, approach to education within the recreation-related major itself. Offering more recreation and human dimensions courses within wildlife and ecology concentrations, and vice versa, is a good place to start. Particularly as many of the VUM issues that PPA currently face are so multi-faceted. Social issues in PPA rarely produce only social impacts, often impacting the wildlife and natural resources as well. Likewise, wildlife and ecological impacts can bleed into the social experience. If assumptions *are* being presented in the classrooms of these majors, be they wildlife focused or recreation focused, then it is important to recognize them and understand them across disciplines. The integrative nature of these programs should extend beyond simple collaboration and student involvement, and an understanding of how specific assumptions and preconceived notions about one concentration can impact another.

Furthermore, the academic fallout from the COVID-19 pandemic has made it abundantly clear that many academic programs and faculty were not only unprepared to teach online but also

lacked critical skills in which to effectively impart learning objectives that, in the recreation-related disciplines, are so dependent on experiential, in-person opportunities and experiences. As many participants attested, their experience within their program was largely dependent on not only the technological capabilities of the faculty but also the replacement of in-person learning experiences with online experiences.

As some of the interviewees highlighted, it is the in-person experiences and hands-on opportunities that make recreation-related courses and programs what they are. One cannot replicate these firsthand, practical experiences over a computer screen. Almost selfish in nature, we in the recreation-related field are here because we literally want to practice what we preach. We *want* to be out in the field. We *want* to be interacting with people or wildlife and the natural environment. We realize and understand the value of these experiences recreationally and want to emulate them professionally. Yet, important teaching and learning opportunities are few and far between when everything is conducted virtually. Any academic discipline can benefit from learning new and unique ways to reach students in more non-traditional ways. Education in and of itself is dynamic, and it is critical that educators are making every effort to continue their own education and enhance their pedagogical methodologies. However, I would argue that continuing education among practitioners is even more critical in the recreation-related field, where positive student experiences are so closely tied to in-person, hands-on opportunities.

Lastly, and perhaps most poignant, I believe it valuable to underscore the additional impacts that learning online during the pandemic caused on students' mental, physical, and emotional health. An institution-wide issue, this topic reiterates the position that it is vital for faculty and staff of recreation-related majors to ensure that they are doing everything in their power to create positive learning experiences for their students, particularly during times when

non-traditional learning opportunities are available. In many ways, this issue creates an opportunity to use and promote the very ideas, themes, and places that make up the very essence of many recreation-related courses. It highlights the need to promote the use of natural spaces around us to improve our own well-being and advocate for more opportunities to be had in these areas. More opportunities to recreate in unique landscapes and observe wildlife. In the spirit of interdisciplinary collaboration, using university, campus, and local resources to assist students becomes paramount. If the past year has shown us anything, it is that preparing students for their career may sometimes come second to supporting them in any way possible and ensuring they thrive even in difficult times.

Conclusions

Assumptions are present everywhere we go. They appear in a variety of contexts or situations, often subconsciously. However, based on the data from this study it appears that no widespread transference of VUM assumptions is happening within recreation-related majors at the universities sampled. And while the students who participated in these interviews do not represent the entire population of such majors and programs, it is encouraging to see that no such assumptions have severely impacted their opinions and understandings of PPA management topics. So why do these assumptions exist in the first place?

It may be due to an overreliance on perpetuated ideas and methods. In other words, thinking or doing things in a certain way simply because "that is the way they have always been done." Furthermore, it may purely be due to the difficulty in studying and addressing them. Both at the research level as well as the instructional level. The very nature of VUM is incredibly dynamic, and what holds true at any given point in time may prove otherwise at

another junction in time. The value of understanding the role of these assumptions lies in how they are addressed. As previously stated, a greater recognition and understanding of implicit bias, assumptions, and preconceived notions is warranted to gain further insight into this phenomenon. Overall, the specific role that instruction plays in perpetuating possible assumptions and preconceived notions remains unknown, and there were unanticipated results that warrant continued consideration.

It was apparent that not only did the students interviewed not have clear, defined career ambitions at this point in their life, but also that many of them had constructive critiques of their individual majors and concentrations. This lack of career specificity among those interviewed does suggest the possibility that some recreation-related majors may not be helping to guide students towards a particular occupational goal. But is that the purpose of these majors, or any programs for that matter – to simply direct students to a specific job position? Or is to also help them become more well-rounded individuals able to use critical thinking skills and address real-world problems using direct application of skills and lessons learned from their academic experiences.

Regardless of what one believes to be the purpose of recreation-related majors, and higher education in general, a reevaluation of certain programmatic goals and objectives is warranted. After all, if a purpose of higher education is to meet the needs of the very population it was created for, shouldn't we listen to what they have to say?

Chapter 5 - Conclusion

This dissertation features three separate, yet interconnected, studies to investigate both the presence and role of assumptions in visitor use management (VUM) research methodology and management decision making within parks and protected areas (PPAs). The purpose of this inquiry was not only to shed light on the implications such assumptions have on VUM research and management actions in PPAs across the United States (U.S.), but also understand how these assumptions impact the educational development of students in recreation-related majors in higher education. This research is important in generating a better understanding of how these assumptions may precondition future PPA managers and ultimately, how they may impact the general management of PPAs.

This concluding chapter summarizes each study and discusses how this research advances the field of applied VUM techniques and education processes. This chapter also suggests recommendations for continued research and investigation into the aspects discussed as well as recommendations and considerations for VUM research and management. Finally, this chapter offers reflections on the implications this study has on the field of VUM and the role recreation-related majors in higher education has on advancing the field.

Chapter Two employed a Delphi study to identify various assumptions VUM experts around the U.S. believe to be present in VUM-related research and management practices. Through the iterative process that the Delphi technique employs (Dalkey & Helmer, 1963), 28 assumptions were initially generated by the experts participating in the study and, furthermore, were ranked by the experts in relation to how prevalent they believed them to be. Comments were also made by the panelists to provide a richer understanding of what the assumptions mean,

and how they may influence the VUM research process as well as PPA management perceptions and decision making. Ultimately, seventeen assumptions were identified which had higher levels of agreement among participants concerning the pervasiveness of said assumptions. This study has important implications for the discipline and application of VUM techniques for three reasons. One, it clearly highlights the presence of a variety of assumptions that VUM experts agree exist. Furthermore, as preconceived notions and inherent assumptions influence the research process at any point (Kirkwood & Price, 2013), it becomes critical to recognize when these assumptions are present and if they are impacting and manipulating the research in negative ways.

This leads to the second implication; in that it becomes important to recognize how these assumptions impact research results as they can often be used to directly influence management decisions in PPAs across the U.S.. While this is an assumption in and of itself – research influences management decisions – the fact of the matter is, much of the VUM research that is conducted in PPAs in the U.S. are conducted to help managers improve the visitor experience and/or help preserve the natural resources therein. Therefore, it is critical that researchers ensure that assumptions are not negatively impacting results used to inform management decisions.

And finally, this study suggests that an opportunity exists for working to achieve a more cohesive approach to VUM research and related PPA research. Despite consensus being reached among participants on many of the assumptions, the fact that some disagreement existed at all, as was evident by some of the comments made, speaks to a potential dearth in cohesion and efforts to work towards a common goal. As many aspects of VUM research exist (e.g. social impacts, ecological impacts, wildlife impacts), it is important that, while specialized and unique research efforts and objectives are important and necessary, the VUM research community considers how

these factors come together to achieve a similar, broader goal – promoting positive recreational and visitor experiences in PPAs while working to protect the resource at the same time.

Chapter Three continued exploring the role assumptions play in the VUM field, specifically related to how they influence the PPA management decision making process. Using ideas from the literature surrounding the manager-visitor relationship as a backdrop, this study investigated how the preconceived notions and preferences of PPA managers align with the visitors who frequent their respective PPA. This study used data from a past VUM study at a U.S. national park in the Midwest in which managers responded to surveys actually taken by visitors, responding *as if they were the visitors*. In other words, managers at this park were asked to anticipate how their visitors would respond to a variety of conditions and preferences related to their experience within the park.

Results from this study indicated that managers at the park were relatively accurate in anticipating how visitors would respond and what their preferences are for various experiences and services within the park. And while data used for this study was manager speculations *of* visitor responses, and not the preferences and beliefs of the managers themselves, the fact of the matter is that managers at this particular park are at least able to think in line with their visitors. This has valuable implications for how decisions are made within the park that ultimately impact the visitor experience. Farrell et al (2001) stated that managers often misjudge visitor perceptions and concerns about the resource, however, generally speaking, results from this study indicated the opposite, at least at this one park. While not a one-to-one comparison regarding manager vs. visitor beliefs and perceptions, this study does suggest that the perceptions of PPA managers may not always be that contrary to their visitors. Continued, more focused,

studies would continue to shed light on this assumption and ultimately help management actions benefit both the visitor experience as well as management goals.

Finally, Chapter Four investigated if any of the assumptions identified in Chapter Two were being disseminated in classrooms of recreation-related majors in various universities around the U.S.. The goal being to both understand if these assumptions were even present as well as to understand how they may be influencing and/or preconditioning future PPA managers and researchers to think in a certain way. Particularly if these influences are promoting concepts and ideas based on assumptions that are contrary to the effective management of these areas as well as the research process which could inform said management. To gain insight into this, semi-structured interviews were conducted with students in recreation-related majors that discussed aspects of PPA as well as aspects of VUM.

Overall, results indicated that assumptions identified in Chapter Two were not explicitly propagated in the classrooms of the students sampled. However, additional qualitative data was gathered that provided beneficial insight into how various recreation-related majors are serving their students. For example, it has been documented that an interdisciplinary approach to academics is beneficial in a variety of ways (Buchbinder et al, 2005; Dressel & Marcus, 1982), however many of the comments made by students indicated that this interdisciplinary approach was, at times, lacking. And while the results from this study should not be taken as evidence that every recreation-related major needs a complete curriculum change, it does present another opportunity to see where improvements can be made.

Additionally, it should be noted that this study also would benefit from additional investigation as it is not clear whether the students would even recognize the assumptions even if they *were* being disseminated. While this study generated beneficial qualitive information on the

student experience with these recreation-related majors, it presents an opportunity to explore the instructional aspect of how these assumptions may influence the educational process. In other words, it becomes important to understand if the instructor recognizes if certain assumptions are being passed down to the students. It is not so much that assumptions should be avoided but disseminated in a way that mitigates the potential negative influences of them in practical and even theoretical applications. Regarding conditioning future PPA managers, this aspect is particularly important as the misapplication of VUM related assumptions can perpetuate misrepresentations that may negatively impact future management decisions as well as negatively impact the visitor experience.

Assumptions are unavoidable, and not necessarily a problem in and of themselves, however it is important that efforts are made to recognize them and promote discussions around them to better understand their potential impact. Results from this research make it abundantly clear that VUM related assumptions exist. The question that remains, is how are they impacting both the research process and/or management decisions that are being made in PPA in the U.S.? Furthermore, it is important to continue investigating the role these assumptions play in the education of future PPA managers.

While this study raises additional questions, it also presents multiple opportunities regarding how VUM is approached as a discipline. This is particularly important given the application of specific strategies and techniques that are employed to address the variety of VUM issues in PPA in the U.S. Especially as the Interagency Visitor Use Management Framework has become the systemized approach to VUM across all federally managed public lands, it is critical that researchers and managers are implementing best practices and using the most relevant, appropriate data available on which to base decisions and actions. Data that is not influenced by

unacknowledged assumptions that potentially goes against the best interests of the visitor experience and the protection of natural resources as well as data that misrepresents actual conditions, behaviors, or attitudes. With the recreation-related field, and VUM field being so intertwined within it, it is paramount that PPA researchers, managers, and anyone else involved with the decision-making process in these areas are constantly evaluating their methods and procedures and make every effort to work towards best practices. In this way, the continued enjoyment and protection of the myriad resplendent, awe-inspiring, and unique PPA around the U.S. can be better achieved.

Final Thoughts

"The more I read, the more I acquire,
the more certain I am that I know nothing."
~ Voltaire

Like any dissertation, this journey was a learning process and the studies undertaken highlighted not only opportunities for continued research but also areas for continued growth. I can confidently say that I know quite a bit more than "nothing" as far as visitor use management research, practices, and education goes. However, the above quote by Voltaire exemplifies the importance of how the learning process should be both a personal reflection and constructive critique of what still needs to be known.

The original manifestation of this dissertation revolved around a general question: "Why do we, as VUM researchers, continue to ask certain questions or utilize certain methods when they often generate the same answers?" While this question is not only broad but somewhat

naïve, it spoke to a desire to evaluate parks and protected area research practices and the idea that, despite the value of these practices, whether or not they can also fall victim to their unchanging nature. At this point in my doctoral process I had been involved with numerous VUM research projects that often utilized similar methods, asked similar questions, and which yielded similar results. This is by no means asserting that these were not worthwhile or effective endeavors. Even unchanging results provide valuable information in a variety of contexts. However it did speak to that continued urge to study *why* we do what we do. In short, this is how the investigation into how assumptions influence VUM research developed.

Overall, I am satisfied with the end result that is my doctoral dissertation. I believe that, if nothing else, I will have promoted some discussion around how assumptions fit into various VUM related aspects as well encourage a reevaluation of how VUM research is conducted, even if at a basic level. It is my hope that the results generated from these studies will support future research that investigates these ideas more critically, whether that is to be my own research or someone elses. And while I feel assured that I accomplished what I sent out to do, there are certainly aspects which I recognize could have used improvement and highlight the notion that the more we learn the more we realize we don't know.

Chapter Two represents, in my opinion, the most cohesive study of the three main studies conducted. The methodology, analysis, and discussion represent a detail-oriented and comprehensive look into the phenomenon under investigation – assumptions in VUM research. That being said, I would have liked to have taken more time to better understand what those assumptions actually mean, something that would have involved further interactions with the participants as well as taken additional time, something I did not have at that state.

Chapter Three represents an intriguing look into how certain assumptions influence the management decision making process within PPAs, yet I feel I fell short in describing its relevancy and place in the VUM literature. I think taking the time to conduct additional statistical analyses would have helped clarify the importance of this study. Additionally, I believe I could have done a better job of framing certain results and providing a richer explanation of how they enrich the literature related to PPA management. This chapter underscored my own personal deficits, and opportunities for growth, in the form of gaining a greater handle of statistical analyses as well as a greater understanding of the literature surrounding specific management aspects of PPAs.

Chapter Four is both one that I was most excited about and also the chapter which requires the greatest amount of refinement. While I was excited to explore the educational side of VUM related topics and discuss these topics with students, my methods and analysis of this process were the weakest. A novice to the semi-structured interview process, I not only did not create pointed enough questions to glean the necessary information, but I also neglected to utilize any validation techniques to help add rigor and trustworthiness to my study. This is not to say that this chapter is entirely without merit, merely it speaks to the continued need to evaluate my own research processes and methods and learn from my shortcomings.

Furthermore, while I feel I uncovered valuable information (even if it wasn't directly tied to my initial research question) in regards to the educational experiences of recreation-related majors, I did not adequately relay the importance of those results in the discussion. Incorporating more aspects of educational theory and practices would not only help reinforce some of the comments and conclusions made, but also help bridge the gap between the VUM discipline and the education field.

As previously stated, I believe I sufficiently accomplished what I set out to do. While I may have only scratched the surface regarding some of the topics addressed and some of the methods could have been more succinct, many of these realizations occurred only after completion of the research itself. This is an inherent part of the research process! Questions beget more questions. The multi-faceted critique that comprises the dissertation review process should provide opportunities to further develop the ideas and conclusions resulting from it. Not only that, this critique should promote the personal and professional growth of the individual who submitted it. Given the opportunities for continued and refined research prospects, in addition to the recognition of continued learning gaps, I believe that this dissertation has been effective at exactly that.

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Appendix A - Delphi Study Research Materials

A.1. Delphi Study Invitation Letter

Dear [insert participant name],

Because of your contribution to, and experience with, visitor-use management (VUM) in parks and protected areas, you have been identified as someone with valuable input that would greatly inform this current study. The objective of this study is to identify possible assumptions in VUM research which inform management decisions in parks and protected areas. As a member of a panel of experts, you would learn from others and share your opinions regarding visitor management approaches with a variety of experts in academia. Michael Brunson, a PhD student in the Park Management & Conservation program at Kansas State University and under the advisement of Dr. Ryan Sharp, is conducting this study as part of his dissertation.

I am writing to request your participation in this phase of my dissertation research. This phase is utilizing a Delphi approach (Dalkey & Helmer, 1963), which involves a series of rounds of questions to reach consensus. This process, should you choose to participate, consists of three rounds that will take approximately 20-30 minutes each to complete. You will be allotted two weeks to complete each form.

The first response will be to identify under what capacity you have been involved, or are currently involved, with VUM related research in parks and protected areas. The questions will solicit feedback regarding methodological assumptions present in VUM research.

The second response form will include an anonymous compilation of assumptions identified by the panel, and a categorization of said assumptions. You will be asked to rank the assumptions by level of importance using a given scale.

The third response form will provide anonymous rankings of all members of the expert panel. You will be given an opportunity to re-rate and provide feedback. You will also be asked to respond to additional information that comes up throughout the study. Both majority and minority opinions will be recorded and reported.

After each round, we will be sharing all of the ideas generated by the expert panel and seek your evaluation to determine the most relevant. This means that you will need a time commitment of approximately two months to be available to respond to a short questionnaire on three separate occasions. It is for this reason that we seek commitment from knowledgeable individuals like you.

Risks: Except for your time and any inconvenience, there is no risk to you from participating in this study.

Benefits: The study will result in potential recommendations regarding next steps to take in approaching visitor-use management issues in parks and protected areas. Additionally, this study may help inform current and future VUM researchers and park managers about effective planning methods for visitor satisfaction in parks and protected areas.

Confidentiality: While the researcher will know the individuals participating, no names or emails will be attached to any individual responses. Complete anonymity amongst participants will be kept.

Voluntary: Your participation in this research is completely voluntary. You may choose to stop participating at any time throughout the study, and you may choose not to answer any questions that you do not wish to answer.

Contact Information: If you have any questions about this study, please contact Michael Brunson at michaelbrunson@ksu.edu. I look forward to working with you and all of the experts that will be a part of this valuable network.

Do you wish to participate?

If yes, please follow this link: [link to Qualtrics survey]

If no, please respond via email:

_____No, I do not wish to participate

_____No, I do not wish to participate because I do not consider myself an expert on visitor-use management nor have I performed any research related to visitor-use management.

Thank you for your time, and I look forward to hearing from you.

Sincerely,

Michael Brunson

PhD Student; Park Management & Conservation | Kansas State University

A.2. Delphi Round One Reminder Letter

Dear [insert participant name],

I recognize that the initial letter I sent requesting your participation for this visitor management study occurred during an interesting time in our lives, given the current state of things related to the Coronavirus. For this reason, and due to your extensive experience on the topic, I would like to request your participation one more time in hopes that you might be able to find the time within the next week to participate and complete the first questionnaire. Your participation in this study is very valuable to me, hence I sincerely hope that you can find the time in your busy schedule to be involved.

The first response form is provided in the link below. I have also attached the first request for participation, which provides more information regarding the study. Please complete the form by April 10, 2020. On average, it has taken others who have responded 20 minutes to complete the first questionnaire. I would like to emphasize that the source of all data will remain confidential. If you have already completed this survey by the time you receive this, I appreciate your participation!

Follow this link to the Survey: [link to Qualtrics survey]

Thank you for your time, and I look forward to hearing from you.

Sincerely,

Michael Brunson

PhD Student; Park Management & Conservation | Kansas State University

A.3. Delphi Round One Thank You Letter

Dear [insert participant name],

I sincerely appreciate your willingness to participate in my Delphi study regarding assumptions in visitor use management. I wanted to thank you for sharing your valuable knowledge, insights and ideas. Your reply, along with other visitor management experts from around the country, indicates the importance of this topic, and is most valuable to the success of this study. I greatly appreciate your response to this first round and hope that you can continue to share your expert knowledge through the remainder of this study. You will be receiving information regarding the second questionnaire no later than Monday April 20, 2020.

Thank you again for your time.

Sincerely,

Michael Brunson

PhD Student; Park Management & Conservation | Kansas State University

A.4. Delphi Round Two Invitation Letter

Dear [insert participant name],

Thank you for your continued willingness to participate in my Delphi study: Assumptions in Visitor Use Management. Initial response to this study has been very positive and I greatly appreciate your contribution, ideas and time. Your insight adds to the collective viewpoint that this topic is important and relevant. It is clear there is an overall interest in understanding how these assumptions play into visitor use management research.

Fourteen experts were initially invited to participate. Eight responded to the first round of questions. This resulted in 28 assumptions believed to be present in VUM research. As you will see in the second round of questions, I extracted four themes in which to categorize these assumptions. These categories include; 1) management related assumptions; 2) experiential assumptions; 3) resource related assumptions; and 4) methodological assumptions. This classification was completed by me, Michael Brunson, a PhD student at Kansas State University. Descriptive validity was maintained by keeping the original wording and intent of responses. Where appropriate, overlapping concepts were combined to minimize repetitive and/or similar assumptions.

The second round of questions, which can be accessed via the link below, consists of the aforementioned categories and associated assumptions. The next task will be for you to examine those assumptions and allocate points to each in relation to how important you think they are. In other words, you will rank the following based on the level at which you think the assumption

impacts VUM research as a discipline. For example, if you think assumption X is more pervasive in our discipline than assumption Y, allocate more points to assumption X. You will be asked to allocate a total of 100 points between assumptions in each category.

Lastly, since you will have had the opportunity to review responses from the entire panel, you are strongly encouraged to please share additional comments and thoughts. This will be an opportunity to clarify any of your own statements, as well as comment on others. This will help generate a deeper understanding of how these assumptions fit into the important work we all do, and provide for a more robust interpretation of what these assumptions mean.

Thank you again for your continued participation in this study. As a reminder, your participation is voluntary and at any point in the study you may decline to participate, and your responses and identity remain completely anonymous to the Delphi panel. Only the researcher is aware of those participating. If you have any questions, please contact me at michaelbrunson@ksu.edu.

In order to keep within the timeline of this research, please complete the next round of questions by Monday, May 4, 2020. It is estimated that this questionnaire will take you approximately 20-30 minutes to complete.

To access the second round of questions, please click on this link, or cut and paste it into your browser: [link to Qualtrics survey]

Thank you again for your continued insight and participation.

Sincerely,

Michael Brunson

PhD Student; Park Management & Conservation | Kansas State University

A.5. Delphi Round Two Reminder Letter

Dear [insert participant name],

I recognize that the current state of the world remains an interesting time to request your continued participation in my Delphi study. However, due to your involvement in the first round and your valued input, I am sending a friendly reminder in the hopes that you are able to continue your commitment to this study. Your participation in this research is very valuable to me, hence I sincerely hope that you can find the time in your busy schedule and continue to be involved.

The second response form is provided in the link below. Please complete the questionnaire by Friday May 8, 2020. On average, it has taken others who have responded 15 minutes to complete the second questionnaire. I would like to emphasize again that the source of all data will remain anonymous between participants. The addition of your contact information at the end of the questionnaire is only to keep track of those who have completed it.

Follow this link to the survey: [link to Qualtrics survey]

Thank you for your continued participation and I look forward to hearing from you.

Sincerely,

Michael Brunson

PhD Student; Park Management & Conservation | Kansas State University

A.6. Delphi Round Two Final Request for Participation

Dear [insert participant name],

I am writing to inform you that I am extending the deadline for completion of the second round of the Delphi questionnaire an additional week. Because of your input in the first round and your continued value in this study, I am hoping you are able to find time in your busy schedule to complete the second round of questions. On average, it has taken participants around 15 minutes to complete the second questionnaire.

I appreciate your participation and expertise in this study, and hope you are able to find the time to continue your contribution to this important topic. I will be extending the deadline to complete the second round to Friday, May 15, 2020.

The link to the second questionnaire can be found below, and I would like to emphasize again that all data remains confidential amongst participants.

Survey Link: [link to Qualtrics survey]

Thank you again for your time and I look forward to hearing from you.

Best,

Michael Brunson

PhD Student; Park Management & Conservation | Kansas State University

A.7. Delphi Round Two Thank You Letter

Dear [insert participant name],

Thank you for your continued participation in my Delphi study addressing assumptions in visitor use management research. Your continued involvement, along with other visitor management experts from around the country, indicates the importance of this topic, and is most valuable to the success of this study. I greatly appreciate your responses to the second round and hope that you can continue to share your expert knowledge through the remainder of this study. You will be receiving information regarding the third questionnaire no later than Friday, May 29, 2020.

Thank you again for your time.

Best,

Michael Brunson

PhD Candidate; Park Management & Conservation | Kansas State University

A.8. Delphi Round Three Invitation Letter

Dear [insert participant name],

Thank you for your continued willingness to participate in my Delphi study: Assumptions in Visitor Use Management. Response to this study continues to be very positive and I thank you for your continued commitment to share your insight. The purpose of this concluding round is to complete the final prioritization of assumptions you, as well as the rest of the panel, believe to be the most pervasive in visitor use management research.

All eight panelists who completed the first round responded to the second round of questions (100% response rate). Each respondent distributed one hundred points among each set of assumptions, which were generated from you, the panel respondents. The mean, range, and standard deviation have been calculated for each category based upon the scores given by the panel members who responded. You will notice that some assumptions have been removed due to lower mean values and allocated points. The attached questionnaire includes the remaining assumptions, in no particular order, along with their associated descriptive statistics. Comments from the panel are also included.

This final round provides you one final opportunity to rank the remaining assumptions in light of knowing how the entire panel rated the twenty-eight (28) assumptions. My objective is to move toward consensus. A greater level of consensus is achieved if the standard deviation and/or the range for each assumption is reduced. I also request that you provide further information or

comments which you think might help me better understand the scope of each assumption, as this will continue to add a deeper understanding of these ideas.

Please complete this third questionnaire by Friday, June 12, 2020. I greatly appreciate your continued participation and I look forward to receiving your response.

Link to questionnaire: [link to Qualtrics survey]

Thank you once again for your contribution and time.

Best,

Michael Brunson

PhD Candidate; Park Management & Conservation | Kansas State University

A.9. Delphi Round Three Reminder

Dear [insert participant name],

First of all, I wanted to thank you for your continued engagement and participation in my Delphi study regarding assumptions in visitor use management research. Your input is greatly appreciated.

I also am reaching out as a reminder to please complete the third and final round of the study if you are able. Unfortunately, Qualtrics recently had an issue where it may not have fully recorded your response, despite you attempting to do so. I sincerely apologize for any inconvenience but if you could find the time to complete the final questionnaire, or retake it if the case may be, as soon as possible it would be greatly appreciated. If you are having to resubmit, this will in no way affect the data.

In an attempt to ensure that your response is logged, please make sure you progress through the questionnaire until you see the notification that your response has been recorded. It will continue to be helpful to also include your email in order to keep track of completed surveys. This information remains anonymous amongst participants.

On average it has taken respondents 15 minutes to complete the questionnaire.

The link to said questionnaire is here: [link to Qualtrics survey]

Thank you for your patience regarding this matter. I am extremely grateful for your involvement and hope to conclude this study with everyone who participated in the first two rounds completing this final round.

Please don't hesitate to reach out to me with any questions or concerns.

Best,

Michael Brunson

PhD Candidate; Park Management & Conservation | Kansas State University

A.10. Delphi Final Thank You Letter

Dear [insert participant name],

I sincerely thank you for your participation in my Delphi study: Assumptions in visitor use management research. I recognize that this process was lengthy and time-consuming, and I appreciate your willingness in seeing the study through to its completion. Your thoughts and insight, along with those of other visitor-use experts around the country, indicate the valuable nature of this study. I will be sharing results at the completion of my research.

Thank you again for your time and input.

Best,

Michael Brunson

PhD Candidate; Park Management & Conservation | Kansas State University

A.11. Delphi Round One Survey

Delphi Round One

Start of Block: Introduction

Q1
Delphi Panel Questionnaire: Round One

Thank you for your participation! Your professional and expert input is greatly appreciated. This survey, which is the first round in this process, should take you approximately 20-30 minutes to complete.

Project Information

Project Title: Plans for the Future: An Examination of Research Methodology and Education in Parks and Protected Area Visitor Use Management
Risks: This is a minimal risk research study. That means that the risks of participating are no more likely or serious than those you encounter in everyday activities.
Benefits: Although you will not directly benefit from this study, it has been designed to learn more about visitor-use management research methods. The study will result in potential recommendations regarding next steps to take in approaching visitor-use management issues in parks and protected areas. Additionally, this study may help inform current and future VUM researchers and park managers about effective planning methods for visitor satisfaction in parks and protected areas.
Confidentiality: The researchers will make every effort to ensure that the information you provide as part of this study remains confidential. Your identity will not be revealed in any publications, presentations, or reports resulting from this research study. No names or emails will be attached to any individual responses. Complete anonymity amongst participants will be kept. We will collect your information through Qualtrics, and while online activities always carry a risk of a data breach, we will use systems and processes that minimize breach opportunities. All data will be destroyed at the culmination of this study and not be used for future research nor be used for commercial profit.
Voluntary: Your participation in this research is completely voluntary. You may choose to stop participating at any time throughout the study, and you may choose not to answer any questions that you do not wish to answer. If you choose to withdraw after we have already collected information, your information will not be used for the purposes of the study and promptly be destroyed.
The Institutional Review Board (IRB) for the protection of human research participants at Kansas State University has reviewed this study and deemed it EXEMPT from further review

under criteria set forth in the Federal Policy for the Protection of Human Subjects, 45 CFR §46.101, paragraph b, category: 2. subsection: ii. If you have questions about the research study itself, please contact the Principal Investigator , Michael Brunson, at michaelbrunson@ksu.edu, or 315.529.6993. If you have questions about your rights or would simply like to speak with someone *other* than the research team about questions or concerns, please contact the IRB Director at 785.532.3224 or comply@k-state.edu.

End of Block: Introduction

Start of Block: Research Background and Experience

Q2 Approximately how many years have you been involved with visitor-use management (VUM) research (round up)?

▼ 1 (1) ... Over 20 years (21)

Display This Question:

If Approximately how many years have you been involved with visitor-use management (VUM) research (r... = Over 20 years

Q3 If over 20 years of involvement, enter years of VUM research involvement here (e.g. 35).

_____

Q4 Approximately how many of those years were you the Principal Investigator?

_____

Q5 Are you **CURRENTLY** involved with VUM research?

- ○ Yes (1)
- ○ No (2)

Q6 Does, or did, your research methods include/consider current management frameworks (or current at the time)? (e.g. ROS, VERP, IVUM, etc.)

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Does, or did, your research methods include/consider current management frameworks (or current at... = Yes

Q7 Which frameworks? Check all that apply.

- ☐ Limits of Acceptable Change (LAC) (1)
- ☐ Visitor Impact Management (VIM) (2)
- ☐ Visitor Experience and Resource Protection (VERP) (3)
- ☐ Recreation Opportunity Spectrum (ROS) (4)
- ☐ Carrying Capacity Assessment Process (C-CAP) (5)
- ☐ Quality Upgrading and Learning (6)
- ☐ Visitor Activity Management Process (VAMP) (7)
- ☐ Interagency Visitor Use Management (IVUM) (8)
- ☐ Other (9) _____

Q8 What specific methods do/did you incorporate into your research? Check all that apply. (e.g. photo panels, qualitative/quantitative surveys, trail counters, human behavior cameras, etc)

- ☐ Photo Panels (1)
- ☐ Trail Counters (2)
- ☐ Human Behavior Cameras (3)
- ☐ Qualitative Surveys (4)
- ☐ Quantitative Surveys (5)
- ☐ Other (6) _____
- ☐ I do not/did not incorporate any of these methods. (7)

End of Block: Research Background and Experience

Start of Block: Research Assumptions

Q9 The following questions refer to assumptions in visitor-use management research. These assumptions could be social, ecological, or spatial-temporal in nature. For the purpose of this study, we are defining an assumption as the following:

"A belief that some phenomenon is true, despite there being a lack of proof."

For example, visitor perceptions of crowding illustrates one such possible assumption. Generally speaking, we may assume that crowding in parks and protected areas causes displacement. However, this may or may not be true given the inherent complexity in actually measuring said displacement.

Please note: The use of this example should not exempt it from your own list. If you feel this is a valid assumption, please include it.

Q10 Do you believe assumptions are built into VUM research methods and applications?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Do you believe assumptions are built into VUM research methods and applications? = Yes

Q11 What are those assumptions? Explain with as much detail as you are able to provide.

_____

_____

_____

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Display This Question:

If Do you believe assumptions are built into VUM research methods and applications? = No

Q12 Why not? Please explain why you believe assumptions are not present in VUM research.

_____

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_____

End of Block: Research Assumptions

Start of Block: Background Information

Q13 Are you:

- ○ Female (1)
- ○ Male (2)

Q14 What is your age? Please enter numerically (e.g. 45).

_____

Q15 Current position/title. (e.g. Associate Professor, Adjunct Faculty, Retired, etc)

_____

Page Break

Q16 Are you currently teaching, or did you teach, a course/courses that discuss VUM issues and/or specific frameworks?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Are you currently teaching, or did you teach, a course/courses that discuss VUM issues and/or spe... = No

Q17 What is the name of the course, or courses, and what do you incorporate/teach that is VUM related? (e.g. specific frameworks, concepts, current issues, etc.)

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Q18 Where do you, or did you, teach this course or courses?

_____

End of Block: Background Information

A.12. Delphi Round Two Survey

Delphi Round Two

Start of Block: Introduction

Q1
Delphi Panel Questionnaire: Round Two

Thank you for your continued participation! Your professional and expert input is greatly appreciated. This survey, which is the second round in this process, should take you approximately 20-30 minutes to complete.

Project Information

Project Title: Plans for the Future: An Examination of Research Methodology and Education in Parks and Protected Area Visitor Use Management
Risks: This is a minimal risk research study. That means that the risks of participating are no more likely or serious than those you encounter in everyday activities.
Benefits: Although you will not directly benefit from this study, it has been designed to learn more about visitor-use management research methods. The study will result in potential recommendations regarding next steps to take in approaching visitor-use management issues in parks and protected areas. Additionally, this study may help inform current and future VUM researchers and park managers about effective planning methods for visitor satisfaction in parks and protected areas.
Confidentiality: The researchers will make every effort to ensure that the information you provide as part of this study remains confidential. Your identity will not be revealed in any publications, presentations, or reports resulting from this research study. No names or emails will be attached to any individual responses. Complete anonymity amongst participants will be kept. We will collect your information through Qualtrics, and while online activities always carry a risk of a data breach, we will use systems and processes that minimize breach opportunities. All data will be destroyed at the culmination of this study and not be used for future research nor be used for commercial profit.
Voluntary: Your participation in this research is completely voluntary. You may choose to stop participating at any time throughout the study, and you may choose not to answer any questions that you do not wish to answer. If you choose to withdraw after we have already collected information, your information will not be used for the purposes of the study and promptly be destroyed.
The Institutional Review Board (IRB) for the protection of human research participants at Kansas State University has reviewed this study and deemed it EXEMPT from further review under criteria set forth in the Federal Policy for the Protection of Human Subjects, 45 CFR

§46.101, paragraph b, category: 2. subsection: ii. If you have questions about the research study itself, please contact the Principal Investigator , Michael Brunson, at michaelbrunson@ksu.edu, or 315.529.6993. If you have questions about your rights or would simply like to speak with someone *other* than the research team about questions or concerns, please contact the IRB Director at 785.532.3224 or comply@k-state.edu.

End of Block: Introduction

Start of Block: Instructions

Q2 Upon review of the first round of responses, I extracted themes in which to categorize assumptions you believe to be present in visitor-use management research. Those categories include; 1) management related assumptions; 2) experiential assumptions; 3) resource related assumptions; and 4) methodological assumptions.

The next task will be for you to examine the following assumptions and allocate points to each in relation to how important you think they are. In other words, you will rank the following based on the level at which you think the assumption impacts VUM research as a discipline. For example, if you think assumption X is more pervasive in our discipline than assumption Y, allocate more points to assumption X. You will be asked to allocate a total of 100 points between assumptions in each category.

Lastly, since you have reviewed responses from the entire panel, you are invited to share additional comments and thoughts. This will be an opportunity to clarify any of your own statements, as well as comment on others. This will help generate a deeper understanding of how these assumptions fit into the important work we all do.

End of Block: Instructions

Start of Block: Management Assumptions

Q3 Listed below are a number of **management related assumptions**. By assigning numerical point values, please rank the following based on the level at which you think the assumption impacts VUM research as a discipline. For example, if you think assumption X is more

pervasive in our discipline than assumption Y, allocate more points to assumption X, so on. You will have 100 points to allocate and all values must add up to 100.

	Points (8)
Research influences management decisions (1)	
Parks and protected area managers are different than visitors. (2)	
Increasing diversity in park use is desirous and won't change management priorities (4)	
Visitor capacity will solve all our VUM challenges (5)	
Urban parks are a stepping stone to more rural experiences, rather than an end goal in their own right. (6)	
Designation and/or managing agency of a PPA matters to visitors. (7)	
Desired future conditions should mimic a single historic point in time. (8)	

Total	

Q4 Please use the space below to include additional thoughts or comments related to the aforementioned assumptions.

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End of Block: Management Assumptions

Start of Block: Experiential Assumptions

Q5 Listed below are a number of **experiential related assumptions**. By assigning numerical point values, please rank the following based on the level at which you think the assumption impacts VUM research as a discipline. For example, if you think assumption X is more

pervasive in our discipline than assumption Y, allocate more points to assumption X, so on. You will have 100 points to allocate and all values must add up to 100.

	Points (1)
Visitors act in a rational manner that follow the Recreation Demand Hierarchy. (1)	
Visitor perceptions are formed around cognitive hierarchy. (2)	
Visitors are motivated to achieve desired outcomes from a recreational experience while protecting the environment at the same time. (3)	
There is a strong relationship between the amount of visitor use, crowding, and conflict. (4)	
Visitors are willing to accept limits on recreation use to achieve higher quality recreation opportunities. (5)	
Crowdedness contributes to a low quality experience and displacement (6)	
Displacement due to crowding is bad. (7)	

Visitor crowding and density are the same thing. (8)	
Higher use levels are undesirable. (9)	
Delineation of preferences and user groups between front and backcountry conditions. (10)	
Visitors prefer the least impacted landscapes. (11)	
Visitors can perceive and evaluate resource impacts (social or ecological). (12)	
Total	

Q6 Please use the space below to include additional thoughts or comments related to the aforementioned assumptions.

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End of Block: Experiential Assumptions

Start of Block: Resource Related Assumptions

Q7 Listed below are a number of **resource related assumptions**. By assigning numerical point values, please rank the following based on the level at which you think the assumption impacts VUM research as a discipline. For example, if you think assumption X is more pervasive in our discipline than assumption Y, allocate more points to assumption X, so on. You will have 100 points to allocate and all values must add up to 100.

	Points (1)
A dichotomy exists between natural and cultural resources. (1)	
Strong relationship between amount of visitor use and resource impact. (2)	
Visitor density contributes to wildlife displacement. (3)	
There is a clear relationship between use levels and associated impacts. (4)	
Total	

Q8 Please use the space below to include additional thoughts or comments related to the aforementioned assumptions.

_____

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End of Block: Resource Related Assumptions

Start of Block: Methodological Assumptions

Q9 Listed below are a number of **methodological related assumptions**. By assigning numerical point values, please rank the following based on the level at which you think the assumption impacts VUM research as a discipline. For example, if you think assumption X is more

pervasive in our discipline than assumption Y, allocate more points to assumption X, so on. You will have 100 points to allocate and all values must add up to 100.

	Points (1)
Research is influenced by visitors not local communities. (1)	
Data with low response rates represent patterns. (2)	
Indicators and thresholds measure social norms. (3)	
Behavioral intentions measures actual behavior. (4)	
Visitor spatial-temporal behavior is driven by factors we can measure in VUM in predictable ways. (5)	
Total	

Q10 Please use the space below to include additional thoughts or comments related to the aforementioned assumptions.

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_____

End of Block: Methodological Assumptions

Start of Block: Contact

Q11 In order to coordinate responses and remaining Delphi rounds, please provide your email below. **As per the study design, all responses and identities remain anonymous between participants.**

_____

End of Block: Contact

A.13. Delphi Round Three Survey

Delphi Round Three

Start of Block: Introduction

Q1
Delphi Panel Questionnaire: Round Three

Thank you for your continued participation! Your professional and expert input is greatly appreciated. This survey, which is the third and final round in this process, should take you approximately 20-30 minutes to complete.

Project Information

Project Title: Plans for the Future: An Examination of Research Methodology and Education in Parks and Protected Area Visitor Use Management
Risks: This is a minimal risk research study. That means that the risks of participating are no more likely or serious than those you encounter in everyday activities.
Benefits: Although you will not directly benefit from this study, it has been designed to learn more about visitor-use management research methods. The study will result in potential recommendations regarding next steps to take in approaching visitor-use management issues in parks and protected areas. Additionally, this study may help inform current and future VUM researchers and park managers about effective planning methods for visitor satisfaction in parks and protected areas.
Confidentiality: The researchers will make every effort to ensure that the information you provide as part of this study remains confidential. Your identity will not be revealed in any publications, presentations, or reports resulting from this research study. No names or emails will be attached to any individual responses. Complete anonymity amongst participants will be kept. We will collect your information through Qualtrics, and while online activities always carry a risk of a data breach, we will use systems and processes that minimize breach opportunities. All data will be destroyed at the culmination of this study and not be used for future research nor be used for commercial profit.
Voluntary: Your participation in this research is completely voluntary. You may choose to stop participating at any time throughout the study, and you may choose not to answer any questions that you do not wish to answer. If you choose to withdraw after we have already collected information, your information will not be used for the purposes of the study and promptly be destroyed.
The Institutional Review Board (IRB) for the protection of human research participants at Kansas State University has reviewed this study and deemed it EXEMPT from further review under criteria set forth in the Federal Policy for the Protection of Human Subjects, 45 CFR §46.101, paragraph b, category: 2. subsection: ii. If you have questions about the research study itself, please contact the Principal Investigator , Michael Brunson, at michaelbrunson@ksu.edu,

or 315.529.6993. If you have questions about your rights or would simply like to speak with someone *other* than the research team about questions or concerns, please contact the IRB Director at 785.532.3224 or comply@k-state.edu.

End of Block: Introduction

Start of Block: Instructions

Q2 Analysis of the second round of responses was conducted using SPSS and descriptive statistics were generated. The mean, range, and standard deviation for each assumption are listed below. You will notice that some of the assumptions have been dropped due to lower mean values and allocated points.

In an effort to move towards consensus, the next task will be for you to re-examine the following assumptions and again assign points to each in relation to how important and/or pervasive you believe them to be in VUM research. In other words, you will re-rank the following based on the level at which you think the assumption impacts VUM research as a discipline. For example, if you think assumption X is more pervasive in our discipline than assumption Y, allocate more points to assumption X. You will be asked to allocate a total of 100 points between assumptions in each category. To clarify, assigning a value of 0 does not necessarily mean you believe the assumption does not exist, simply that you do not believe it is pervasive or impactful.

Lastly, since you have reviewed comments from the entire panel, you are invited to once again share additional comments and thoughts. This will be the final opportunity to clarify any of your own statements, as well as comment on others. This will help generate a deeper understanding of how these assumptions fit into the important work we all do. Again, as will be the final round, this is your last opportunity to comment on these assumptions.

End of Block: Instructions

Start of Block: Management Assumptions

Q3 Listed below are the comments from the previous round related to the management related assumptions. The assumptions follow along with their associated descriptive statistics. Please re-rank the following based on the level at which you think the assumption impacts VUM research as a discipline as well as based on any comments provided by the panel. For example, if you think assumption X is more pervasive in our discipline than assumption Y, allocate more points to assumption X, so on. You will have 100 points to allocate and all values must add up to 100. To clarify, assigning a value of 0 does not mean you believe the assumption does not

exist, simply that you do not believe it is present or impactful in VUM research.

Panel Comments

"Many managers are reticent to advance VUM without research to back them up."

"Visitor capacity is one part of a larger solution."

"More diverse parks (this is already happening) is absolutely requiring a shift in management."

"The statement about desired conditions describing a fixed point in time does not seem to reflect relevant thinking and managing for the diverse circumstances."

"Visitor capacity has dominated our literature, and I believe this is presumed to be a solution to many issues protected area managers are facing."

"Looking at the list now, I'm surprised there isn't anything about "complexity" in the management assumptions. The assumptions are all about managers and the public but not the relationships that managers have with partners, etc., or the outside influences (politics, economy) that drive PPA managerial decisions. I think that as researchers, we often assume that we are looking at a VUM question finite enough that it eliminates some of this complexity, but that is a huge assumption."

	Points (1)
Research influences management decisions Mean = 30 Std Dev = 18.32 Range = 10-65 (1)	
Parks and protected area managers are different than visitors. Mean = 10.63 Std Dev = 6.78 Range = 0-20 (2)	
Increasing diversity in park use us desirous and won't change management priorities. Mean = 8.13 Std Dev = 13.08 Range = 0 - 35 (3)	
Visitor capacity will solve all our VUM challenges. Mean = 26.88 Std Dev = 24.49 Range = 0 - 60 (4)	
Desired future conditions should mimic a single historic point in time. Mean = 8.13 Std Dev = 13.61 Range = 0 - 40 (5)	
Total	

Q4 Please use the space below to include final thoughts or comments related to the aforementioned assumptions and panel comments.

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End of Block: Management Assumptions

Start of Block: Experiential Related Assumptions

Q5 Listed below are the comments from the previous round related to experiential related assumptions. The assumptions follow along with their associated descriptive statistics. Please re-rank the following based on the level at which you think the assumption impacts VUM research as a discipline as well as based on any comments provided by the panel. For example, if you think assumption X is more pervasive in our discipline than assumption Y, allocate more points to assumption X, so on. You will have 100 points to allocate and all values must add up to 100. To clarify, assigning a value of 0 does not mean you believe the assumption does not exist, simply that you do not believe it is present or impactful in VUM research.

Panel Comments

"I'm not sure about the crowding related assumptions that are listed in the previous section. My sense is that the literature reflects the nuances between demographics, specialization, places, etc., such that these assumptions are more constrained to specific studies rather than field-wide."

"Rationale visitors - that's too funny. I do think for them, the decisions they are making make sense at that time. They might not know any better. The unconscious incompetent category of visitor."

"I'm certain some segment of visitors has desired experiences that also align with their low impact environmental values...goes to the point that visitors are not homogenous groups."

"Displacement - this is so hard and there certainly seems to be a perception among managers that this is bad but I think it's a process that could lead a visitor to discover NEW places and NEW experiences that ultimately stretch and grow us as humans."

"Higher use levels are undesirable - that depends, am I trying to have a wilderness or back-

country experience? Or am I at the National Mall?"

"I generally think that recreationists are rationale, and behave following the 'rational actor' model. I also feel that the cognitive hierarchy is useful for understanding behavior."

"It really gave me pause to see the one about "visitors care about recreation AND conservation." I think this is a huge assumption, and one that I hadn't identified earlier. We see how individuals and organized groups prioritize recreation far above conservation (and some may not include conservation at all), and as a field this is a huge challenge for research and research-informed management. Especially if we are trying to broaden visitorship and bring in people who may not have a strong conservation ethos to begin with. We can't assume that everyone cares about parks beyond their own recreation thrills."

"Some of the assumptions like visitors being willing to tolerate limits for the sake of less impacts aren't really assumptions. They are realities for how people make decisions."

"...assumptions by definition are things that aren't proven to be true. A number of points in the previous list (e.g., people thing in terms of a cognitive hierarchy, recreation demand model,

correlations between crowding and conflict) aren't assumptions - they are frameworks that have been tried and tested over time."

	Points (1)
Visitors act in a rational manner that follow the Recreation Demand Hierarchy Mean = 10.38 Std Dev = 13.24 Range = 0 - 35 (1)	
Visitor perceptions are formed around cognitive hierarcy Mean = 13.63 Std Dev = 15.38 Range = 0 - 35 (2)	
Visitors are motivated to achieve desired outcomes from a recreational experience while protecting the environment at the same time. Mean = 17.50 Std Dev = 10 Range = 0 - 30 (3)	
There is a strong relationship between the amount of visitor use, crowding, and conflict. Mean = 10.50 Std Dev = 11.55 Range = 0 - 30 (4)	
Visitors can perceive and evaluate resource impacts (social or ecological). Mean = 10.62 Std Dev = 15.22 Range = 0 - 45 (5)	
Total	

Q6 Please use the space below to include final thoughts or comments related to the aforementioned assumptions and panel comments.

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End of Block: Experiential Related Assumptions

Start of Block: Resource Related Assumptions

Q7 Listed below are the comments from the previous round related to **resource related assumptions**. The assumptions follow along with their associated descriptive statistics. Please re-rank the following based on the level at which you think the assumption impacts VUM research as a discipline as well as based on any comments provided by the panel. For example, if you think assumption X is more pervasive in our discipline than assumption Y, allocate more points to assumption X, so on. You will have 100 points to allocate and all values must add up to 100. To clarify, assigning a value of 0 does not mean you believe the assumption does not exist, simply that you do not believe it is present or impactful in VUM research.

Panel Comments

"I actually didn't really feel that these assumptions were pervasive, hence the equal ranking. Perhaps it's because this is less of my area, but also because I see some of these statements as qualified, nonlinear, etc."

"I think the research contributing to wildlife displacement from visitor density is yet to be determined and highly site and species specific."

"Two of these are the same - the relationship between increased use and increased impact. This is true and is a major assumption - we always assume that the use impact curve exists and are trying to find out the slope of the curve for individual contexts. However, I'd say that the dichotomy between natural and cultural resources is a larger assumption - that resources are of one type or the other and spatially separated. Because of this large overarching assumption, the assumptions about what use-impact relationships look like are a related but secondary level. The

use-impact relationship for an area would look different if we didn't assume resources to be separate entities, separately experienced by visitors."

"Again, many of the previous points weren't actually assumptions. The points that people displace wildlife or that use results in impact, for instance are well documented patterns. I thought there was actually just one assumption listed related to dichotomies."

	Points (1)
A dichotomy exists between natural and cultural resources. Mean = 28.13 Std Dev = 30.58 Range = 0 - 100 (1)	
There is a clear relationship between use levels and associated impacts. Mean = 32.50 Std Dev = 21.04 Range = 0 - 70 (2)	
Total	

Q8 Please use the space below to include final thoughts or comments related to the aforementioned assumptions and panel comments.

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End of Block: Resource Related Assumptions

Start of Block: Methodological Assumptions

Q9 Listed below are the comments from the previous round related to methodological related assumptions. The assumptions follow along with their associated descriptive statistics. Please re-rank the following based on the level at which you think the assumption impacts VUM research as a discipline as well as based on any comments provided by the panel. For example, if you think assumption X is more pervasive in our discipline than assumption Y, allocate more points to assumption X, so on. You will have 100 points to allocate and all values must add up to 100. To clarify, assigning a value of 0 does not mean you believe the assumption does not exist, simply that you do not believe it is present or impactful in VUM research.

Panel Comments

"I feel like all these assumptions get at that we are "just doing the best we can." We don't practice a science where randomized control trials are feasible or where we have full control over a context and our participants. In that way, I feel like these concerns (low response rates, inability to follow up longitudinally to assess behavior, transferability among standardized settings, etc.) may be pervasive across applied sciences like VUM. However, I also feel that there is an unspoken assumption embedded in these in that our science is unique. While this is somewhat true, I think it's pervasive to assume that we can only compare to data within our discipline rather than across disciplines. For example, what do response rates or the relationship between intention and behavior look like in other sciences? I don't hear a lot about how our methodological assumptions might be contextualized if we find more/better ways of comparing outside of VUM too."

"Wow! What a great list of assumptions. This is very thought provoking and highlights the need for acknowledging / addressing these shortcomings."

"Again, I don't see the other listed items as pervasive assumptions and more isolated to specific studies."

	Points (1)
Research is influenced by visitors not local communities. Mean = 12.86 Std Dev = 11.13 Range = 0 - 30 (1)	
Data with low response rates represent patterns. Mean = 10.63 Std Dev = 14.00 Range = 0 - 35 (2)	
Indicators and thresholds measure social norms. Mean = 31.88 Std Dev = 11.93 Range = 20 - 50 (3)	
Behavioral intentions measures actual behavior. Mean = 21.25 Std Dev = 16.64 Range = 0 - 50 (4)	
Visitor spatial-temporal behavior is driven by factors we can measure in VUM in predicable ways. Mean = 25 Std Dev = 26.19 Range = 0 - 80 (5)	
Total	

Q10 Please use the space below to include final thoughts or comments related to the aforementioned assumptions and panel comments.

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_____

End of Block: Methodological Assumptions

Start of Block: Contact

Q11 In order to coordinate responses and remaining Delphi rounds, please provide your email below. **As per the study design, all responses and identities remain anonymous between participants.**

_____

End of Block: Contact

Appendix B: Semi-Structured Interview Materials

C.1. Semi Structured Interview Request Letter

Hello,

My name is Michael Brunson and I am a PhD Candidate in the Applied Park Science Lab at Kansas State University. I am in the final phases of collecting data for my dissertation and am looking to recruit willing participants for semi-structured interviews to discuss parks and recreation related concepts and ideas. Your professor has kindly agreed to facilitate contacting you in the hopes that you may be able to assist in my research.

The interviews themselves will take approximately 20 – 30 minutes and be conducted via Zoom audio. While there are obligations and commitments on my end that will require some coordination, scheduling these interviews will be based largely on your availability. That being said, I am hoping to conduct these interviews towards the end of March. All responses will be kept confidential, and your identity will be known only to me, the primary researcher. Your name or university will not be attached to any results. All aspects of this research have been reviewed by the Institutional Review Board.

I recognize that this is an interesting and challenging time given the circumstances surrounding the COVID-19 pandemic, and I appreciate the time you are able and willing to provide. Your input will provide valuable information with which to benefit and advance the field of parks and protected areas management and education.

If you are willing to assist with this research and participate in an interview, please reach out to me at your earliest convenience. I would be happy to answer any questions and discuss scheduling options. I can be reached via email at michaelbrunson@ksu.edu or by phone at 315.529.6993.

Thank you for your consideration in this matter, I hope your semester is off to a good start!

Sincerely,

Michael Brunson

PhD Candidate; Park Management & Conservation | Kansas State University

B.2 Semi Structured Interview Guide

Date: **Name:**

Interview Code:

Duration of interview:

Introduction: Welcome and thanks for participating; describe project, recording system, and confidentiality; initial questions?

Year in school:

QUESTIONS:

Background

1) Please tell me your current year and major.

2) Please describe what factors and experiences influenced you to choose this program.

3) What has been your overall experience with your degree program?

4) What are your current plans for employment or continuing education after graduation?

Parks and Protected Areas Experiences

5) What experience have you had with coursework involving parks and protected areas?

6) Please describe your knowledge of specific management frameworks and strategies.

7) What concepts do you remember most from coursework related to parks and protected areas?

8) What concepts do you remember most from coursework related to the specific management of parks and protected areas?

9) What issues related to parks and protected areas are you aware of?

10) What other courses have you taken, either in or outside your degree program not specifically

related to parks and protected areas?

11) Do you feel your academic program/curriculum etc. is missing anything? In other words, do you feel the program you are in could be improved upon? How?

About the questions and research:

12) What are some final comments or questions about the topics we have brought to this discussion?

13) What did you like and dislike from this meeting?

14) Do you have any suggestions for improving this process?

Appendix C – IRB Approval Letter

KANSAS STATE UNIVERSITY | University Research Compliance Office

TO: Dr. Ryan Sharp
Horticulture and Natural Resources
2021 Throckmorton

Proposal Number: 10068

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

DATE: 02/19/2020

RE: Proposal Entitled, "Plans for the Future: An Examination of Research Methodology and Education in Parks and Protected Area Visitor Use Management"

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

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

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

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

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comply@k-state.edu | k-state.edu/comply