

Research Notes

Typologies of Wilderness Backpackers Based on Perspectives of Wilderness Character Trade-Offs: Implications for Campsite Selection

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Abstract

The Wilderness Act of 1964 created federally designated wilderness areas in the United States for both the use and enjoyment of the American people, as well as the preservation of their wilderness character. Although the Wilderness Act mandates the protection of wilderness character, there is significant management discretion and existing trade-offs of values inherent to wilderness character preservation. Previous social science research explores wilderness visitors' values regarding the stewardship of wilderness character qualities, as well as how social factors influence visitor behavior and recreation choice within wilderness areas. Limited studies, however, have attempted to connect wilderness character values and visitor behavior to better inform wilderness stewardship decisions. This study seeks to address this gap by examining both backpackers' evaluations of trade-offs between prioritizing different wilderness character qualities and whether these wilderness values influence their decision/selection among camping opportunities in the Stephen Mather Wilderness of the North Cascades National Park Complex in Washington, USA. Data were collected between May and October 2024 using electronic surveys distributed via email to all SMW backcountry permit holders. Wilderness values were measured by asking level of support for management actions that demonstrated trade-offs between managing different wilderness character qualities (e.g., trading off recreational freedoms to enhance solitude). Campsite selection was determined by reviewing backcountry permit data from Recreation.gov containing the specific locations that each backpacker stayed overnight. Based on the backpackers' reported mean preferences for management actions, a combined hierarchical and k-means clustering approach yielded three distinct typologies with preferences for untrammeled, undeveloped, and natural wilderness character qualities. The wilderness camping permit data was then explored among these three typologies of backpackers. The data reveal that undeveloped-centric backpackers were significantly more likely to camp in undeveloped cross-country zones than semi-developed wilderness campsites compared to other segments of backpack-

ers. This research contributes to our understanding of the nexus between wilderness values and campsite selection and reveals the possible effectiveness of emphasizing diversity in wilderness management across the SMW.

Keywords

Wilderness management, cluster analysis, camping, wilderness character, North Cascades

Introduction

The 1964 Wilderness Act (Public Law 88-577) established a National Wilderness Preservation System (NWPS) and federally designated wilderness areas in the United States “for the protection of these areas, [and] the preservation of their wilderness character” (Section 2a). Though the Wilderness Act mandates the preservation of wilderness character across all wilderness areas in the NWPS, it does not clearly define wilderness character and how management ought to be utilized as a tool for protecting these areas and providing experiences that align with wilderness values and qualities (Landres et al., 2011).

An interagency monitoring framework (Landres et al., 2015) has since established consistent definitions and a national strategy for monitoring wilderness character across the NWPS. This framework defines wilderness character as being comprised of five unique qualities—untrammelled, natural, undeveloped, opportunities for solitude or a primitive and unconfined recreation, and other features of value (e.g., scientific inquiry, history). Each of these five qualities are defined in the framework based on the description of “wilderness” in Section 2(c) of the Wilderness Act.

Wilderness Management Trade-Offs

A primary goal of wilderness management is to strike a balance between preserving these qualities (Landres et al., 2015); however, it has been noted that “these five qualities interact in direct and subtle ways that may complement or conflict with each other,” and that “sometimes a decision to protect one quality of wilderness character may directly degrade another quality” (Landres et al., 2011, pp. 45–46). For example, decisions to restore the natural conditions of a wilderness area by removing non-native species may compromise the untrammelled, or self-willed, quality of wilderness. Visitors may also value conflicting wilderness character qualities (e.g., desiring unimpeded access to wilderness areas while also seeking out solitude). These wilderness character trade-offs are also exacerbated by increasing human use of wilderness areas as well as outside influences from anthropogenic change (Kelly & Landres, 2023). Ultimately, wilderness managers make value-based judgements about what wilderness conditions ought to be managed for, and what wilderness character trade-offs they (and visitors) are willing to accept to steward designated wilderness areas into the future (Cole & Hall, 2008; Landres et al., 2015).

Social science research on visitors’ perspectives of these management trade-offs can help inform decision making, and some studies have examined wilderness visitors’ perspectives on specific wilderness management actions. Many of these studies have focused on the trade-offs concerning managing for solitude or unconfined recreation, particularly on visitors’ preferences for limiting overall use in the wilderness to protect

the natural resources and the quality of visitor experiences (e.g., Cole & Hall, 2008; Hall et al., 2010; Newman et al., 2005; Pierce & Manning, 2015; Shafer & Hammitt, 1995). Some studies found that visitors were willing to trade off some freedoms, like access to recreation, to enhance opportunities for solitude (Newman et al., 2005; Pierce & Manning, 2015); although Hall and others (2010) found that visitors were generally opposed to limiting use to protect solitude. Similarly, Shafer and Hammitt (1995) and Cole and Hall (2008) found that visitors were concerned with limiting wilderness use; however, they also found that visitors were more supportive of use limits if the intention was to protect against human impacts to wilderness ecological resources. Visitors also demonstrated support for some degree of camping management, including the restriction of camping within designated campsites (Cole & Hall, 2008; Hall et al., 2010), though some studies found that visitors had concerns with this kind of restriction (Newman et al., 2005; Pierce & Manning, 2015; Shafer & Hammit, 1995).

Wilderness Place Meanings

These varying preferences for certain wilderness character traits may exist because the meaning of wilderness goes beyond its inherent or utilitarian value as people value different things about the wilderness. The same wilderness might not mean the same thing to different people, because people attach particular emotional, cultural and symbolic meanings and associations with different places or landscapes (Tuan, 1977; Williams, 2002; Williams & Patterson, 1996). For example, a wilderness area may be important to some for its scenic value or its recreation opportunities, while to others, the same wilderness may represent their national heritage or offer a space to escape from society.

Scholars have called for these varying place meanings to be integrated into public land planning and management frameworks because the meanings that people attach to particular places influence their perception of use and management actions within these places (Kil et al., 2010; Kruger & Williams, 2007; Williams, 2002). As stated by Williams (2002), "There is no single, objective condition of the landscape, such as wilderness, with inexorable implications for management. Recognizing wilderness as a kind of meaning certain people give to the landscape, as competing social constructions, helps to frame the question of compatibility between traditional, ecotourism, and ecological values" (p. 125). For example, research in federally designated wilderness found that a variety of emotional, symbolic, functional meanings—remote, roadless, pristine, few people, homeland—were used to describe the character of the Selway-Bitterroot Wilderness, which may be incompatible with different management actions (e.g., fuels treatment) at times (Gunderson, 2006). These perspectives have been found to vary across the Recreation Opportunity Spectrum (ROS) as well (e.g., Kil et al., 2010, 2012; Warzecha & Lime, 2002). Warzecha and Lime (2002) found among Colorado and Green River users in Canyonlands National Park that Green River users with high emotional, symbolic, and/or functional attachment showed more support for prohibiting motorized rafts and less support for reserving campsites and sticking to a predetermined itinerary, demonstrating a stronger desire for a more "wildland" recreation experience. This was compared to Colorado River users who also had high attachment levels, who supported management actions that provided less restrictive opportunities. Among Ocala National Forest visitors, Kil and colleagues (2010) found that highly attached visitors favored certain recreation experiences and benefits (e.g., natural features, rule enforcement, diverse recreation opportunities) more strongly than less at-

tached visitors, and that they expressed higher levels of satisfaction and varying preferences across different ROS-setting characteristics. Similarly, the degree of meaning attached by wildland-urban interface hikers along the Florida National Scenic Trail was also related to their preferences for attaining particular recreation benefits, as well as their preferences for setting attributes across settings (Kil et al., 2012). Recognizing the different values and meanings that people ascribe to places and how they shape their perception of appropriate and inappropriate actions is important for managers in predicting public response, and possible conflict, with proposed management decisions (Gunderson, 2006).

Wilderness Campsites and Campsite Selection

Early wildland recreation management literature proposed the development (or lack thereof) of campsites “for many tastes” (Wagar, 1963). This was then formalized in management and planning frameworks, namely in the opportunity classes set forth through the Recreation Opportunity Spectrum (Clark & Stankey, 1979) and the Limits of Acceptable Change (Stankey et al., 1985)—wherein campsites and other recreation opportunities vary across a spectrum from highly developed to fully undesignated, undeveloped, and natural. Across the NWPS, this spectrum (albeit truncated) is preserved. At one end of the spectrum, primitive campgrounds exist within wilderness boundaries that include pit toilets, a ranger station, food storage boxes, and designated camping pads (e.g., Little Yosemite Valley Campground within the Yosemite Wilderness). At the other end of the spectrum, many (perhaps most) wilderness areas offer no designated campsites, nor camping facilities. Across the interior of this spectrum, we find vignettes offering camping platforms (chickees) with privies (e.g., Marjory Stoneman Douglas Wilderness), designated campsites with open-air toilets (e.g., Rocky Mountain National Park Wilderness), designated camping zones with open-air toilets (e.g., Alpine Lakes Wilderness), designated cross-country camping zones (e.g., Stephen Mather Wilderness), and a plethora of other configurations. Stankey et al. (1984), discuss this spectrum of camping opportunities within the context of the Bob Marshall Wilderness, alone, wherein a Limits of Acceptable Change management direction describes opportunity classes that allow for a variety of campsites ranging from semi-developed outfitter base camps to areas of bare soil (and perhaps a visitor-created fire ring) where camping is likely to occur in contact with other groups, extending on to further afield areas where camping is likely to occur in more complete solitude.

A small body of previous literature has explored how social factors influence selection among these camping opportunities in wilderness settings. White et al. (2001) found that the degree to which visitors value solitude, among other factors, influenced campsite choice in Mt. Jefferson Wilderness. Additionally, the authors found that some backpackers made their “macro” campsite choices (what area of the wilderness to camp in) based on the degree to which this decision was confined, with some backpackers choosing to camp in areas where they were not required to camp in designated campsites. Drage et al. (2021) examined the spatial distribution of outcomes obtained by backpackers in Grand Teton National Park and found that the majority of positive outcomes occurred in designated campsites or dispersed camping zones (as opposed to other non-camping locales in the backcountry), with distinct patterns of outcome attainment between designated and non-designated sites.

Additional research has shown that there may also be other significant factors that play an important role in campsite selection or a recreationist’s willingness to substitute a camping or wilderness experience (e.g., Ferguson et al., 2022; Wynveen et al.,

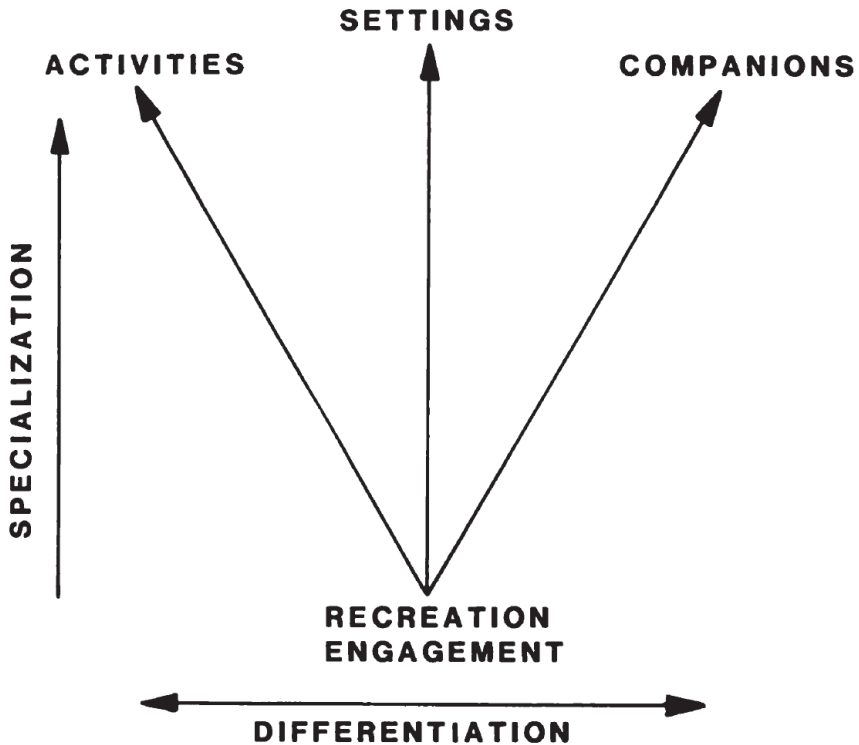
2008). Wynveen et al. (2008) found that experience use history and place bonding were significant predictors of recreationists willingness to substitute their campsite choices and that results were different between setting types across the ROS. For campers at Ellicott Rock (a primitive camping area within a wilderness area of South Carolina's Sumter National Forest), the more rooted or familiar campers were with the area, the more likely they were to substitute for alternative campsites, compared to campers at more developed campgrounds whose willingness to substitute camping experiences decreased as experience and place bonding increased (Wynveen et al., 2008). In addition to social factors influencing recreation decisions, Ferguson et al. (2022) also studied the impact of situational and ecological factors on visitors' behavior and choice in the Lye Brook Wilderness. The authors determined that both situational (e.g., visible garbage, parking accessibility) and ecological factors (e.g., trail erosion, muddiness) significantly influenced visitors' recreational choices and their intention-to-return to the wilderness area, with ecological impacts having a greater negative impact on visitors' experience and their desire to return to the area for future visits.

Theory as it relates to Campsite Selection

Even as early as the 1980s, a wide variety of social and psychological theories were being employed to model choice behavior regarding wilderness recreation locations, including campsite selection (McCool et al., 1985). Cognitive development theory emerged as a primary framework during this era of substantial research on the subject (McCool et al., 1985; Williams, 1985). This theory applied to recreation, defined by Williams (1985) as the "developmental model of recreation choice" (p. 32), posits that recreation decision-making is formed around three domains: setting type, activity type, and social character (Figure 1). As recreationists gain more experience in wilderness settings, the theory suggests that they begin to differentiate distinctions between settings (e.g., developed campsites and dispersed camping areas), activities (e.g., western fly-fishing and tenkara fly-fishing), and social character (e.g., degree of solitude). As recreationists make these distinctions, they also begin to develop specialized taste for their preferred conditions and begin to prioritize one of the domains in their choice of recreation locations to maximize their experience (Williams, 1985). "If, for example, a participant were to distinguish one choice from another with exclusive regard to the primitiveness of the surroundings he/she would be a setting specialist" (Williams, 1985, p. 33). This theoretical model remains in use today concerning campsite choice behavior (e.g., Gursoy & Chen, 2012). For example, Gursoy and Chen (2012) found that among young Taiwanese adults, the greater experience a person has with camping, the more complex their knowledge about camping becomes, and the more likely that specific camping attributes, such as the availability of basic necessities and camping tools, becomes more influential to their campsite selection.

Figure 1

The Developmental Model of Recreation Choice Behavior (Williams, 1985, public domain)



Study Purpose

While previous social science research has either explored visitors' values on the stewardship of wilderness character qualities or how social factors influence wilderness campsite selection, limited research has attempted to connect these two veins of research together to help inform wilderness stewardship decisions. This study seeks to address this gap by answering the following two research questions:

Research Question 1: What typologies exist among wilderness backpackers in the Stephen Mather Wilderness based on their evaluations of trade-offs between wilderness character qualities?

Research Question 2: Does wilderness campsite selection vary across these typologies?

Methods

To explore different typologies of wilderness visitors, we surveyed backpackers in the Stephen Mather Wilderness (SMW) located within the North Cascades National Park Complex in Washington (USA) (see Rice et al. (2026) for the raw data, survey instrument, and associated methodology). Backcountry camping in the SMW may occur in either limited, semi-developed wilderness campsites along trail corridors, or on durable surfaces in undeveloped cross-country zones that start at least one-half mile away

from any trail and one mile away from designated camps (National Park Service, 2021). SMW camping permits are required year-round, and during peak season use between May and October, permits are distributed both online through Recreation.gov via an early-access lottery, followed by a general reservation period, as well as in-person at the Wilderness Information Center (WIC) for walk-up permits. In 2024, approximately 60% of permits were distributed through online advanced reservation, while the remaining 40% of permits were held for walk-up distribution at the WIC. Permits for undeveloped cross-country zone camping are mostly distributed first-come, first-served the day of or the day before a trip, although there are six high-use cross-country zones that are available online for reservations in advance (National Park Service, 2024).

Data Collection

Following Creany et al.'s (2024) sampling methods, we worked with SMW staff to obtain weekly backcountry permit reservation data on Recreation.gov, which included contact information (i.e., email addresses) for SMW backpackers. Electronic surveys were distributed on a weekly basis between July 22 and October 31, 2024, via emails that were sent through Qualtrics to all SMW backcountry permit holders (OMB Control No. 1024-0224; IRB approval FY2024-84). Permit holders were initially contacted to participate in the study on the Monday following their overnight trip in the SMW. A reminder email was sent three days later to non-respondents, followed by a second reminder sent five days after the first reminder to those who still had not completed the survey (Dillman et al., 2014).

Data Measurement

To measure wilderness values, we asked SMW backpackers to consider a series of three scenarios depicting different trade-offs between wilderness character qualities (Table 1). These trade-offs were selected in collaboration with project partners through a series of three one-hour calls between the research team and SMW managers. The first scenario presented four management actions that prioritized either the unconfined recreation experience or the undeveloped quality of wilderness to manage for decreased human impacts on the natural conditions of the SMW (e.g., increasing development by installing metal wildlife-resistant food storage or increasing confinement by requiring campers to hang food or carry a bear can). The second scenario described three management actions that prioritized either the provision of primitive recreational access or the undeveloped quality of wilderness (e.g., providing additional signage to make wilderness recreation easier or limiting the number of developed trails in wilderness). The third scenario presented five management actions that prioritized either the untrammeled or the natural quality of wilderness (e.g., allowing an ecosystem to adapt on its own to change by not intervening or relocating an endangered species to help it adapt). Respondents were asked to evaluate their support for each action presented in all three scenarios using a 5-point Likert scale ranging from -2 ("strongly opposed") to 2 ("strongly support"). To determine if respondents had specialized their campsite choice around differentiated campsite characteristics, we reviewed the backcountry permit reservation data from Recreation.gov that contained locations in which backpackers stayed overnight in the SMW. At the end of the data collection period, all weekly permit data were combined into one file that was imported into IBM SPSS Statistics (Version 29.0.0.0) and then merged with the survey data by pairing permit ID codes contained within both datasets.

Data Analysis

To address the first research question, a two-stage cluster analysis was conducted in JASP (Version 0.19.3.0) to identify distinct typologies of SMW backpackers who completed the survey via email based on their perspectives on wilderness character trade-offs. For wilderness character-based clustering, a hierarchical cluster analysis was conducted using Ward's method to determine an appropriate number of clusters, visualized with a dendrogram (Sarstedt & Mooi, 2019). A k-means cluster analysis was then applied with the predetermined number of clusters to refine the grouping of respondents based on their answers to the series of wilderness character trade-off questions that backpackers evaluated (Sarstedt & Mooi, 2019). After establishing the SMW camper typologies, a chi-square test with decomposing chi-square post hoc tests was used to assess differences in campsite spatial patterns among SMW backpackers from each cluster (Vaske, 2019).

Results

A total of 1,656 emails were sent to wilderness camping permit holder email addresses via Qualtrics. A total of 641 valid responses were collected, following data cleaning—including the removal of outliers, duplicates, and “straight-lined” responses—during the initial data cleaning process (Vaske, 2019). Prior to analysis, an additional 96 surveys were removed because of incomplete data within the wilderness character quality battery. In total, 545 surveys were retained for further analysis, demonstrating a response rate of 32.9%.

Sample Characteristics

Many respondents primarily resided in the United States (95.9%) with 66.8% (336) living in Washington. Of all backpackers in the sample, 421 (77.2%) camped overnight in a semi-developed wilderness campsite while 124 (22.8%) camped in a cross-country camping zone (i.e., undeveloped camping zones outside of designated campsites).

Wilderness Value Typologies

Results of the wilderness typology cluster analysis are presented in Table 1. The combined hierarchical and k-means clustering approach yielded three clusters of SMW backpackers with differentiating wilderness values determined based on their perspectives of wilderness character trade-offs (Figure 1). The clusters were given descriptive names to help identify each cluster based on their generalized perspectives of wilderness character trade-offs:

Cluster 1: Untrammeled-centric backpackers ($n = 173$). SMW backpackers who prioritize a hands-off, untrammeled approach to wilderness management above other wilderness characters (e.g., more supportive of a free-willed ecosystem without intervention and allowing it to adapt on its own).

Cluster 2: Natural-centric backpackers ($n = 177$). SMW backpackers who prioritize maintaining the natural conditions of wilderness above other wilderness characters (e.g., more supportive of removing non-native species to protect native species).

Cluster 3: Undeveloped-centric backpackers ($n = 195$). SMW backpackers who prioritize the undeveloped quality of wilderness above other wilderness characters (e.g., more supportive of reducing the number of trails and campsites in wilderness).

Table 1
Final Cluster Means Resulting From a k-Means Cluster Analysis of Wilderness Character Trade-Off Values

Management Actions	Total (n = 545)		Cluster 1 (n = 173)		Cluster 2 (n = 177)		Cluster 3 (n = 195)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Install metal wildlife-resistant food storage boxes using helicopters rather than requiring campers to hang food or carry bear cans. ¹	0.46	1.33	0.97	0.98	1.12	0.97	-0.67	1.16
Require campers to hang food or carry bear cans in wilderness rather than increasing development in wilderness by installing food storage boxes using helicopters. ²	-0.30	1.10	0.11	0.91	0.07	0.93	-1.04	1.00
Install toilets and transport human waste with helicopters rather than requiring visitors to dig cat holes or pack waste out. ¹	0.57	1.21	0.91	1.00	1.29	0.76	-0.42	1.10
Require visitors to dig cat holes or pack waste out rather than increasing development in wilderness by providing pit toilets. ²	0.11	1.10	0.42	0.94	0.71	0.86	-0.68	0.95
Provide additional signage (directional signs, trail markers) to make navigation in wilderness easier and safer. ¹	0.43	1.02	0.47	0.99	0.81	0.92	0.04	0.98
Maintain and clear lots of existing trails using helicopters and motorized tools (chainsaws, rock drills) to support access to challenging to reach places. ³	0.06	1.16	0.32	1.10	0.51	1.05	-0.64	1.00
Discontinue maintenance of some trails to limit the number of trails in wilderness. ²	0.68	0.93	0.91	0.83	0.83	0.87	0.32	0.94
Relocate threatened and endangered species to help species adapt to climate change. ⁵	0.42	1.02	-0.24	0.93	0.91	0.86	0.53	0.92
Spray (to kill) or remove non-native plants and trees. ⁵	0.39	0.99	-0.06	0.97	0.85	0.80	0.32	0.97
Suppress wildfire to protect old growth forests. ⁵	0.47	1.05	0.01	1.04	0.99	0.83	0.44	0.99
Avoid intervening in the ecosystem to let it transform with a changing climate on its own. ⁴	-0.13	0.89	-0.65	0.74	0.34	0.75	-0.11	0.89
Use management-ignited fire to reduce future high-intensity fires. ⁵	0.93	0.80	0.54	0.80	1.20	0.69	1.03	0.77

Note. Cluster 1 = Untrammed-centric backpackers; Cluster 2 = Natural-centric backpackers; Cluster 3 = Undeveloped-centric backpackers

¹Management actions that support the unconfined quality of wilderness character
²Management actions that support the undeveloped quality of wilderness character
³Management actions that support the primitive recreation access quality of wilderness character
⁴Management actions that support the untrammed quality of wilderness character
⁵Management actions that support the natural quality of wilderness character
*These items are reverse coded.

Scale: -2 = Strongly oppose; -1 = Oppose; 0 = Neutral; 1 = Support; 2 = Strongly support.

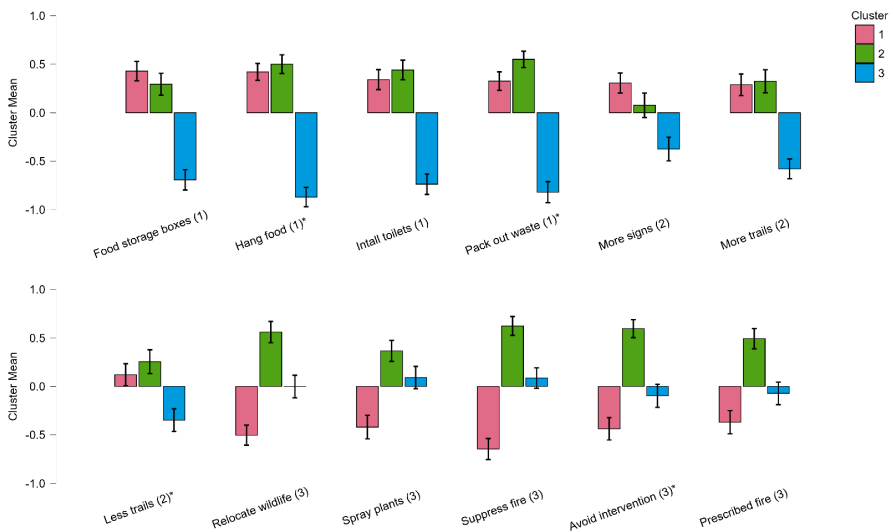
On average, both untrammed-centric and natural-centric backpackers in the SMW were supportive of all management actions in scenario one that prioritized the maintenance of natural conditions, regardless if it would diminish the unconfined and/or undeveloped quality of the SMW. Alternatively, undeveloped-centric backpackers were not supportive of any of these management actions that would degrade either the unconfined or undeveloped quality of the SMW.

In response to management actions presented in scenario two, both untrammelled-centric and natural-centric backpackers were more supportive of actions that prioritized increasing access to primitive recreation opportunities compared to maintaining the undeveloped quality of the SMW on average. Undeveloped-centric backpackers, however, were not supportive of actions that increased primitive recreation access at the expense of increasing development in the SMW.

On average, all three wilderness value typologies had differing perspectives on the management actions presented in scenario three. Untrammelled-centric backpackers were not supportive of any trammeling action in the SMW, on average, in order to maintain the natural wilderness conditions. Alternatively, the natural-centric backpackers were supportive of each action that prioritized the natural conditions of the SMW, on average. The undeveloped-centric backpackers in the SMW reported feeling neutral, on average, about performing these trammeling actions in order to maintain that natural quality of the wilderness.

Figure 2

Mean Difference between Clusters Based on Wilderness Character Trade-off Items Included in the Three Scenarios



Note: Cluster 1: Untrammelled-centric backpackers ($n = 173$). Cluster 2: Natural-centric backpackers ($n = 177$). Cluster 3: Undeveloped-centric backpackers ($n = 195$). Scale: -2 = Strongly oppose; -1 = Oppose; 0 = Neutral; 1 = Support; 2 = Strongly support.

*These items were reverse coded.

Wilderness Campsite Selection

Guided by the developmental model of recreation choice, wilderness camping permit data was explored after cluster analysis for all clusters to determine any statistically significant differences between wilderness campsite specialization across the wilderness value typologies. A chi-square test revealed significant differences in wilderness campsite selection between typologies ($p = 0.012$, Table 2), and decomposing chi-square post hoc tests revealed that undeveloped-centric backpackers in the SMW were significantly more likely to camp in undeveloped cross-country zones than semi-developed wilderness campsites, compared to both other clusters.

Table 2
Wilderness Camping Locations Among Clusters of SMW Backpackers

	Camping Locations		Total
	Campsites	Cross-country Zones	
Untrammeled-centric backpackers ^b	138 (79.8%)	35(20.2%)	173
Natural-centric backpackers ^b	146 (82.5%)	31 (17.5%)	177
Undeveloped-centric backpackers ^a	137 (70.3%)	58 (29.7%)	195
Total	421 (77.2%)	124 (22.8%)	545

Note. Chi-square results: $X^2 = 8.812$; $p = 0.012$. Chi-square post hoc results: different superscripts (^{a,b}) represent statistically significantly different values at a 95% confidence interval.

Discussion

Cluster analysis of overnight wilderness visitors (backpackers) based on their preferences concerning wilderness management trade-offs revealed three clusters: undeveloped-centric visitors, untrammeled-centric visitors, and natural-centric visitors. Our findings related to three backpacker typologies in the Stephen Mather Wilderness (SMW) highlight both theoretical and management implications, which are discussed in turn.

Theoretical Implications of Understanding Wilderness Visitor Typologies

Identifying the meanings and values that people attach to wilderness is important to understanding visitor support for management actions within those areas (Gunderson, 2006; Kil et al., 2010, 2012; Warzecha & Lime, 2001). To measure the wilderness character values that overnight wilderness visitors (backpackers) prioritize in the SMW, we asked visitors to state their preferences for different management actions that prioritize certain wilderness character qualities in the SMW. Cluster analysis revealed three distinct clusters of wilderness character values—untrammeled, natural, or undeveloped quality—that approximately one third of backpackers prioritize and value about the SMW. The untrammeled-centric backpackers showed stronger support for management actions that prioritized a hands-off approach to management in the SMW, on average, thus demonstrating their value for the untrammeled character of wilderness. Alternatively, the natural-centric backpackers more strongly supported management actions that actively maintained the natural quality or conditions of the SMW, as opposed to allowing the wilderness to adapt on its own. Finally, the undeveloped-centric backpackers were the least supportive of actions that encouraged development and instead supported actions that prioritized the undeveloped character of the wilderness.

These findings contribute theoretically to past research that has shown the importance of visitors' values in influencing visitor support for management actions on public lands (e.g., Gunderson, 2006; Kil et al., 2010, 2012; Warzecha & Lime, 2001), with our study providing wilderness-specific findings (i.e., wilderness character values that visitors prioritize play a significant role in wilderness stewardship support). Additionally, unlike previous research on visitors' preferences for wilderness character trade-offs (e.g., Cole & Hall, 2008; Hall et al., 2010; Newman et al., 2005; Pierce & Manning, 2015; Shafer & Hammitt, 1995), this study did not explicitly consider SMW backpackers' perspectives on confining the recreation experience to enhance opportunities for solitude. In a scoping review of wilderness visitor use management literature, Thomsen et al. (2023) showed that research focused the undeveloped quality (and associated trade-offs) of wilderness character is far less common than research focused on the solitude/unconfined trade-off. We asked respondents to consider confinement actions such as imposing additional regulations in the SMW for human waste management and food storage requirements compared to increasing development in the wilderness. On average, the untrammelled-centric and natural-centric visitors supported both confinement and development actions to reduce human impacts, while undeveloped-centric visitors were more strongly opposed to each proposed action.

Lastly, this study represents a relatively rare application of Williams's (1985) developmental model of recreation choice. Our findings fit well within the model's theoretical propositions, specifically that wilderness backpackers in the SMW specialize across wilderness character qualities, and these specialized typologies differentiate their campsite selection. This is a helpful way of conceptualizing choice behavior among wilderness visitors, as the developmental model can help us understand how values and place meanings may drive choice behavior. Specifically, building on the findings of White et al. (2001) concerning wilderness character qualities of solitude and unconfined recreation, we found that backpackers in the SMW who prioritize the undeveloped quality of wilderness character camp significantly more often in non-designated, non-developed sites—thus specializing on undeveloped conditions within the setting domain (Williams, 1985).

Unlike White et al. (2001), this study represents one of the few studies (e.g., Rice & Park, 2021; Sidder et al., 2023) that uses actual camping behavior (revealed preferences), rather than stated preferences. A challenge with using these revealed preferences, however, is that backpackers' decisions to camp in any given campsite may be influenced by other factors beyond their wilderness values such as permit availability, group size, trip duration, among others. While backpacking in the rugged, undeveloped terrain of the SMW cross-country zones does require additional skills and preparation that a specialized recreationist may have, additional research should further inquire into their preferences and decisions for selecting differentiated campsites to understand the strength that wilderness values have in their decision making. Further, our study does not examine how true development of wilderness visitors' leisure careers may impact differentiation—a central premise of the model (Williams, 1985). Future research may find value in examining and testing the temporal aspect of the development model, in addition to the other facets, to help build understanding for how experience use history, skill, serious leisure, and other antecedent conditions may influence specialization, differentiation, and, ultimately, choice behavior within this developmental approach.

Management Implications of Wilderness Visitor Typologies

Each of the three clusters highlighted herein represents approximately one-third of the backpackers in the SMW. These results confirm that backpackers to SMW are not homogenous; reinforcing a point made long ago that the average camper does not exist (Shafer, 1969). For instance, installing food storage boxes in the wilderness may be met with support from the untrammeled-centric and natural-centric visitors, but it would be met with opposition from the undeveloped-centric visitors. Conversely, suppressing fire in the wilderness would be supported by the natural-centric visitors but opposed by the untrammeled-centric visitors. As recognized by Virden and Schreyer (1988), “homogeneous management practices that focus on...generalizations or general land classifications may be insensitive to the complete array of diversity sought by recreationists” (p. 737). Stated plainly, accommodating all visitors, in all places, at all times with a singular management decision is an unrealistic expectation.

Given that there is no single management decision (at least regarding the wilderness character trade-offs discussed herein) that will be embraced by all of the visiting population (see Figure 2), there is an opportunity for SMW managers to recognize the varying typologies of wilderness visitors when making and communicating decisions. Regarding management approaches, there may be an opportunity to recognize the varying typologies through spatial and temporal variation of management approaches (e.g., prioritizing the undeveloped quality in particular zones across the wilderness). Further, when it comes to communicating such decisions, explicit discussion of different types of visitors, including what wilderness values they prioritize, can help people understand different decisions, even if their agreement with such decisions is low; transparency and clearly communicated decisions can also contribute to trust-building between visitors and managers (Stern & Coleman, 2014).

The findings of this study also align with the guidance of Wagar (1963), who suggested having a variety of camping opportunities to meet campers (including backpackers) widely varying preferences and needs. Principally, these data underscore the potential value of offering a variety of wilderness campsites, including those that are developed with some facilities (e.g., bear box or “bear hang”, campfire ring, cleared tent pad, etc.) and those that offer a more primitive, undeveloped, and unconfined experience. From a wilderness management perspective, this can help managers achieve a balance between undeveloped and natural conditions—wherein natural conditions are prioritized through the concentration of impacts in developed campsites and undeveloped conditions are prioritized in cross-country camping zones.

Conclusion

Although the Wilderness Act mandates the protection of wilderness character, there is significant management discretion and existing trade-offs among values inherent to wilderness character preservation. As wilderness managers consider the need to preserve wilderness character, as well as the core wilderness objective of providing a particular type of recreation experience, it can be beneficial to understand wilderness visitors and their preferences for recreation conditions and management approaches. We examined backpackers’ evaluations of trade-offs among different wilderness character qualities, and whether their expressed wilderness values influence their selection of campsites in the Stephen Mather Wilderness (Washington, USA). Our findings highlight three different backpacker typologies, each of which underscores visitors with different priorities for wilderness values and management actions in wilderness.

Understanding these typologies can help wilderness managers tailor decision-making (and associated communications) in a way that supports the broad range of preferences across the wilderness visitor population.

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