



Visitor use and the wilderness experience in the Stephen Mather Wilderness, North Cascades National Park

Final Report





ON THIS PAGE

Sunrise from Sahale Glacier Camp
Unsplash/Eric Dekker

ON THE COVER

Trappers Peak
NPS/Michael Silverman

Visitor use and the wilderness experience in the Stephen Mather Wilderness, North Cascades National Park

Final Report

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Executive Summary



Hiker resting outside the closed Sourdough Lookout. Michael Shroyer

Response Rate and Sample Size

- The response rate of day users completing the Qualtrics survey via a tablet or QR code was 78.1%; The response rate of overnight users completing the online survey via email was 38.7%.
- After data cleaning, a total of 766 completed surveys were analyzed: 178 day users (76.8%), 588 overnight users (23.2%).

Visitor Demographics

- 97.0% of day users and 95.8% of overnight users were U.S. residents. Most domestic visitors traveled from within Washington and other nearby Pacific Northwest areas.
- The average age of day users was 40 years old with a median age of 35. For overnight users, the average age was also 40 years old with a median of 37.
- A notable portion of visitors reported household incomes of \$100,000 or more (66.5% of overnight users and 60.8% of day users). This is roughly \$20,000 higher than the median U.S. household income (\$80,610) and \$5,000 higher than the median household income in Washington (\$94,952) according to the most recently available data from the U.S. Census Bureau.
- The majority of both day and overnight users identified as White, with 374 overnight users and 102 day users reporting this race category.

Group Characteristics

- Average group size among day users was 2.33 individuals, with a median of 2 and a standard deviation of 1.66; Average group size among overnight users was 2.48 individuals, with a median of 2 and a standard deviation of 1.70.

- Most respondents did not travel with an organized group (96.6% of day users; 95.8% of overnight users). 2.9% overnight users visited with organizations compared to day users (1.1%). Only overnight users (0.9%) reported traveling with a commercially guided group.

Stephen Mather Wilderness Experience

- On-trail hiking was the most common primary activity identified among 85.9% of day users; 72.2% of overnight users identified backpacking as their primary activity.
- Overnight users reported higher participation in mountaineering/alpine climbing (25.5%), off-trail hiking (20.1%), night sky viewing (26.9%), and wildlife viewing (28.2%), which were all less common activities reported among day users.
- A significantly higher proportion of overnight users, 61.7%, identified as "Committed Recreationists," to their primary activity compared to 53.7% of day users.
- The average duration of stay for overnight users was 1.96 nights, with stays ranging from one to nine nights.
- Day users spent an average of 8.04 hours in the wilderness, with durations ranging from 0.25 to 48 hours.
- 84.6% of overnight users, stopped at the Wilderness Information Center to pick up their permits.
- A significantly higher proportion of overnight users (55.1%) were aware of being in a designated Wilderness area compared to day users (38.4%).
- The average number of years since visitors' first trip in the Stephen Mather Wilderness (SMW) was 4.21 years for day users and 6.82 years for overnight users.
- Summer is the most popular season for visits, with 66.9% of day users and 86.9% of overnight users visiting between June and August. Fall also sees high visitation, with 67.4% of day users and 53.9% of overnight users visiting between September and November.
- The majority of visitors, 67.4% of day users and 78.7% of overnight users, used the park website for trip planning. Recreation.gov was another widely used resource, with 38.8% of day users and 72.8% of overnight users relying on it for trip planning. Third-party apps and websites, such as AllTrails and the Washington Trails Association, were used by 46.6% of day users and 52.7% of overnight users.

Wilderness Experience Quality

- Most issues were regarded as not being a problem at all during visitors' trips in the SMW.
- 80.2% of overnight users and 84.7% of day users reported toilet paper and human waste as not a problem at all; only 6 individual overnight users and 1 individual day user reported this as a serious problem.
- 97.7% and 98.6% of overnight and day users, respectively, stated that the presence of scientific monitoring stations and equipment was not a problem at all.

- 21.5% of overnight users and 12.8% of day users stated motorized noise was either a slight or moderate problem encountered on their trip
- Visitors overall indicated that seeing and hearing other visitors had a slightly negative impact on their experience of solitude in the wilderness, on average.
- Having a visitor capacity for designated camping was perceived positively, with overnight users viewing it more favorably than day users, on average.

Wilderness Values and Motivations

- Both day and overnight visitors slightly agreed that commercial guides improve accessibility to wilderness experiences, on average.
- Day and overnight users remained fairly neutral about the number of guided trips in the wilderness, though on average, they both slightly disagreed that there were too many guided trips and outfitters.
- On average, all users agreed that the SMW is their preferred place visit for the specific types of recreation activities they like to do.
- Both day and overnight visitors slightly agreed on average, that no other place can compare to SMW and that they would not substitute any other place for the recreation activities they do in SMW.
- Compared to other National Parks in the Pacific Northwest, both day and overnight visitors agreed, on average, that the North Cascades should be the least developed and most challenging to access.
- On average, both day and overnight users were most likely to be motivated by their desire to connect with nature and seek solitude in the wilderness.
- Overnight users, on average, were more motivated by challenge and unconfined recreation than day users; day users rated nature as a higher motivator than overnight users.

Visitor Use Management Perspectives

- On average, respondents generally supported or remained neutral concerning the various rationing methods, other than increasing the fee or cost for campsite reservations, which received a more negative response from both day and overnight users.
- Day users were most in favor of using a combination of rationing techniques and a combination of timeframes or booking windows to release campsite reservations. Overnight users had similar responses.
- Day users reported an average preferred booking window of approximately 1.59 months with responses ranging from 0 to 8 months. Their maximum booking window averaged 3.72 months, with a wide range from 0 to 32 months.

- Overnight users showed similar preferences, with a slightly lower preferred average booking window of 1.49 months and a range of 0 to 12 months. Their average maximum booking window was 3.79 months and a range from 0 to 24 months.
- A majority of both day (61.9%) and overnight (60.7%) users reported being “not at all likely” or “slightly likely” to use a shuttle service to visit places within North Cascades National Park (NOCA). Slightly more overnight users indicated they were “very likely” (9.2%) or “extremely likely” (10.9%) to use the transit service, compared to day users (7.1% and 4.8%, respectively).

Wilderness Management Perspectives

- Generally, both day and overnight users expressed feeling neutral to supportive of both development and recreation confinement in the SMW, on average. This suggests that on average, both day and overnight users prioritize reducing human impacts to the natural conditions in wilderness over management that prioritizes unconfined and undeveloped characteristics of wilderness.
- On average, visitors prioritize having greater access to primitive recreation as opposed to management focused on the undeveloped quality of wilderness. Specifically, day users on average were most supportive of providing additional signage to help make navigation in the wilderness easier and safe, while overnight users were least supportive of discontinuing the maintenance of some trails to limit the number of trails in the wilderness on average.
- Generally, day and overnight visitors shared higher priority concerns for actively maintaining natural wilderness conditions rather than managing for the untrammelled character of wilderness, on average. Both day and overnight visitors were most supportive of using management-ignited fire to reduce future high-intensity fire. The least supported management action presented in this scenario by both day and overnight users was to intervene in the ecosystem rather than allowing it transform with a changing climate on its own.
- Cluster analysis of overnight wilderness visitors (campers) based on their preferences concerning wilderness management trade-offs, revealed three clusters: Undeveloped-centric visitors, Untrammelled-centric visitors, and Wilderness gardeners. Each of these clusters represents approximately one third of the wilderness camper base in the SMW. These results confirm that there is no “average visitor” to the SMW.
- On average, both day and overnight visitors were least supportive of removing the existing fixed anchors and disallowing the placement of future anchors in the SMW. The most supported climbing-related management action from day and overnight users was increasing patrols of climbing rangers to check permits and assess resource and climbing conditions on average.
- Visitors also provided several recommendations for planning or managing the SMW:
 - **Access:** A commonly reported overall concern was balancing access to the wilderness with resource preservation.

- **Backcountry Permits:** Respondents commonly expressed their concern regarding the backcountry permitting process. Some made note of the difficulty of accessing the WIC to pick up permits (e.g., traveling further or having to backtrack to get there, needing to pick up permits prior to 11am). Others expressed frustration with needing to make reservations for backcountry trips far in advance and recommended increasing first-come, first served permits and adding priority access for locals.
- **Wildness and Preservation:** A significant portion of responses stressed the importance of keeping the wilderness "wild."
- **Safety and Regulation Enforcement:** Safety concerns regarding wildlife and climbing access were expressed by some respondents.
- **Education and Awareness:** A smaller subset of feedback discussed the importance of educating visitors about responsible wilderness usage, environmental impacts, and safety.

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List of Terms

Mean - The mean is a measure of central tendency that represents the average value of a set of numbers. It is calculated by summing all the values and dividing by the total number of observations.

n - The symbol "*n*" refers to the sample size, representing the number of observations or participants in a study or analysis.

SD or Std. Dev.: Standard Deviation - The standard deviation measures the spread or variability of a set of data points around the mean. It quantifies the average distance between each data point and the mean.

Quartile - A statistical term that refers to the division of a data set into four equal parts, each containing a quarter (25%) of the data points.



Campsite at Easy Pass. NPS/unknown

Introduction

The North Cascades National Park Complex (NOCA Complex) encompasses some of the most rugged and wild alpine terrain in the lower 48. It spans 684,000 acres across three units: North Cascades National Park, Lake Chelan National Recreation Area, and Ross Lake National Recreation Area. In 1988, congress designated approximately 94% of the NOCA Complex (642,340 acres) as the Stephen Mather Wilderness (SMW), making it one of the largest wilderness areas in the continental United States.

Visitor use in the NOCA Complex has increased in the last few years, driven in part by the COVID-19 pandemic, thus creating management challenges in balancing the protection of high-quality resources and social conditions. This study was conducted to support North Cascades managers and planners in their recently initiated Wilderness Stewardship Planning effort. Specifically, the study evaluates current visitor motivations, values, and desired experiences, including knowledge about federally designated wilderness, behaviors, and perspectives on management actions within wilderness boundaries.

Developed in collaboration with managers and planners, the survey instrument was designed to provide a reference point for assessing any long-term trends that will support long-term wilderness planning efforts in SMW. The results also provide insights into current SMW visitor characteristics including demographics, use patterns, primary trip planning sources, familiarity with Leave No Trace principles, and perspectives on congestion, crowding, wildlife, transportation and park infrastructure. Additionally, this study aims to continue building the foundation for visitor use management social science in wilderness across multiple National Park Service units.

This technical report summarizes the methods, results, and key findings from the 2024 data collection efforts. This study was conducted by a collaborative team of researchers including a social scientist with the Aldo Leopold Wilderness Research Institute, faculty and graduate researchers from the University of Montana faculty, and staff with the National Park Service. All the data presented in this report were collected and analyzed by this research team.



Backpackers standing along the Sourdough Mountain summit. NPS/Michael Silverman

Methods

Study Design

This survey instrument was co-produced in close collaboration with federal land managers at multiple units, over several years. First, in 2021, the U.S. Forest Service' Aldo Leopold Wilderness Research Institute (ALWRI) and the University of Montana worked with the National Park Service Planning and Special Studies Division, the Denver Service Center, and Everglades National Park to create a survey instrument tailored to the needs of wilderness stewardship planning, which encompasses both recreation and transportation management. The survey instrument was created with workshops between the research team (i.e., ALWRI and University researchers) and the management and planning team (i.e., NPS regional and national planners, and Everglades planners and managers). The survey instrument then passed through the NPS Office of Management and Budget (OMB) programmatic clearance process and was implemented at Everglades National Park.

The survey implemented at North Cascades National Park (NOCA) mirrors the pilot study at the Everglades and used the previously approved Everglades survey instrument as a starting point. The research team engaged with NOCA managers and planners in virtual workshops, and through email communications, to adapt the previously accepted survey to the needs of NOCA, and to ensure that the questions both supported their planning needs and were likely to resonate with the local population. A statistical review was conducted by the research team and, additionally, Station Statistician (Dr. Scott Baggett, RMRS) provided a review.

The survey implementation and analysis methods were developed primarily by the ALWRI PI, Dr. Chris Armatas, a Research Social Scientist, and University of Montana Cooperators (Dr. Jenn Thomsen and Dr. Will Rice), with critical local context provided by NOCA planners and managers. The final study design was approved by the University of Montana Institutional Review Board (IRB-FY2024-84) and the U.S. Office of Management and Budget (Control Number 1024-0224).

Data Collection

This study aims to support NOCA's wilderness stewardship planning process for the Stephen Mather Wilderness (SMW) by providing an evaluation of visitor experiences, values, motivations, opinions about management actions, and demographics of visitors recreating within the SMW. The population of interest included both day and overnight wilderness visitors during the high-use season. Data collection occurred between July 22nd and October 31st, 2024. Sample locations for day visitors included the following trailheads and access points: Cascade Pass, Boston Basin, Eldorado, Thornton Lakes, Pyramid Lake, Thunder Creek, East Bank, Easy Pass, and Cooper Ridge Fire Lookout (see Figure 1).

Day-use visitors were intercepted along the trail or within the parking lot upon returning from their hike. The survey utilized a census approach, meaning every eligible group encountered was asked to participate in the survey. When the group approached, the surveyor approached the group (or individual) and politely asked for their participation in the study. If the respondent accepted the survey, the surveyor would begin with the administration of the instrument. If a group was

intercepted, the member with the next upcoming birthday was asked to participate. If the respondent declined to participate, they were asked to report the year of their first visit to the SMW and the number of people in their group to assess non-response bias.

Alternatively, overnight visitors were surveyed via email, and therefore, were not intercepted for surveying on-site. Overnight visitors to the SMW were instead contacted via email to complete an electronic survey through Qualtrics. Email addresses for overnight permit holders were obtained through weekly emails sent by SMW staff, which included reports containing all NOCA backcountry permit reservation details such as permit holder email addresses, entry and exit date, camping locations, and more for that week. Prior to sending these reports, SMW staff filtered out all administrative and commercial use permits, so that only non-commercial users of the public were contacted to participate in this study. Emails were sent from Qualtrics to the email addresses associated with their backcountry permit reservations on the Monday following the visitor's trip. A reminder email was sent three days later to non-respondents, followed by a second reminder five days after the initial reminder for those who still had not completed the survey (Dillman et al., 2014).

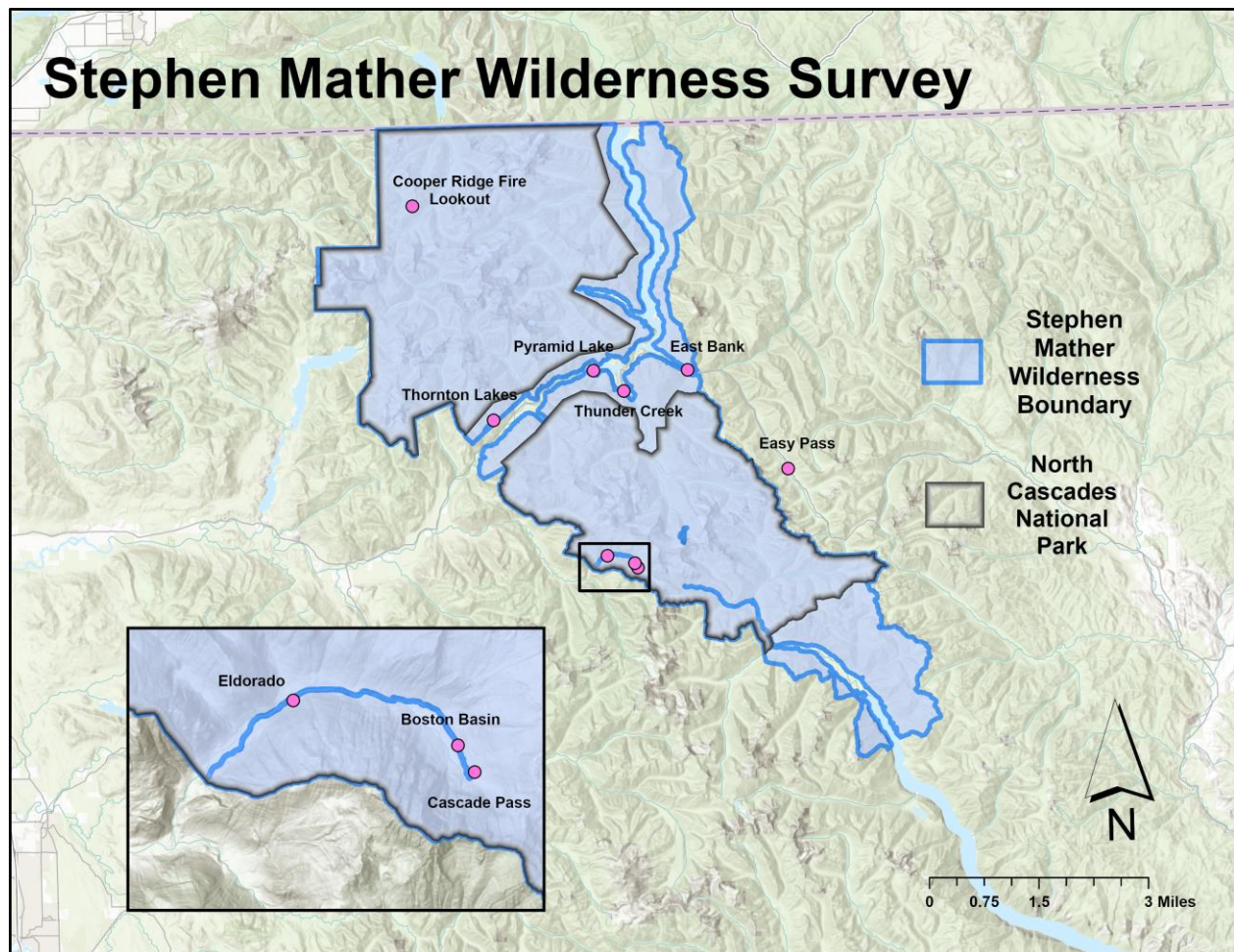


Figure 1. Survey locations within the Stephen Mather Wilderness Boundary and North Cascades National Park Complex

Data Analysis Methods

Survey Data Cleaning

The survey data was downloaded directly from Qualtrics, the software used to collect survey responses. All backcountry permit data were sent by North Cascades staff weekly in a .csv file that contained permit holder emails and trip information such as entry and exit date, locations, and camping locations. Using Microsoft Excel, each weekly .csv file was combined into one .csv file using that contained all the backcountry permit data obtained during the data collection period. Both the survey data and the backcountry permit data files were imported into IBM SPSS Statistics and merged into one file by pairing the survey data with the email that was included in the permit data.

Following Vaske (2008) guidelines, the survey data was then cleaned using SPSS. Only visitors who had recreated within the SMW boundary were eligible to participate in the study. Surveyors determined day-user eligibility based on whether the visitor crossed into the wilderness boundary during their hike. All overnight users, however, were sent an email to participate in the study. Overnight users whose backcountry permit camping locations were not situated within the wilderness boundary were then removed from the sample. Data was also cleaned for outliers, straight lining, and duplicated surveys.



View from above Hidden Lake. Michael Shroyer

Data Analysis

After data cleaning, the data were analyzed with a combination of common statistical tests used in outdoor recreation survey research (Vaske, 2008). This included basic descriptive statistics and frequencies and tests including confirmatory factor analysis, cluster analysis, Pearson chi-square test, and independent sample t-tests. All statistical analyses were conducted in SPSS (Version 29.0.0.0) and/or JASP (Version 0.19.3.0).

Confirmatory Factor Analysis of Motivations

The battery of motivation indicators included in the survey were derived from Driver et al. (1987), Lang and Borrie (2021), and Dorman (2019). Following data cleaning, a Confirmatory Factor Analysis (CFA) was conducted in JASP (Version 0.19.3.0) to test whether the motivation indicators adequately measured the pre-specified structure of motivation dimensions. Five latent constructs were assessed: Challenge, Social, Nature, Solitude, and Unconfined. Each motivation construct was measured using three separate indicators. An Unweighted Least Squares (ULS) estimate was used to conduct the CFA because all indicators were measured as ordinal data using the above Likert scale (Rhemtulla et al., 2012; Xia & Yang, 2019, Thomas et al., 2024). Cronbach's alpha coefficient was then calculated to determine the reliability of each indicator to measure their respective motivation construct (Vaske, 2019). Cronbach's alpha coefficients with values greater than .65 are considered acceptable (Vaske, 2019), while factor loadings from the CFA should be at least .50, but ideally, factor loadings should be .70 or higher (Hair et al., 2014).

Cluster Analysis of Wilderness Character Trade-offs

A two-stage cluster analysis was used to identify subgroups of overnight wilderness visitors who completed the survey via email based on their perspectives on wilderness character trade-offs. For wilderness character-based clustering, we first conducted a hierarchical cluster analysis using Ward's method to determine an appropriate number of clusters, visualized with a dendrogram. We then applied a k-means cluster analysis with the predetermined number of clusters to refine the grouping of respondents based on their answers to a series of questions asking them to evaluate wilderness character trade-offs. K-means cluster analysis was used to group respondents into three clusters—Undeveloped-centric visitors, Untrammelled-centric visitors, and Wilderness gardeners. After clustering, a chi-square test and post hoc tests were used to assess significant differences in spatial patterns among visitors in each cluster.

Results

Response Rate and Sample Size

The response rate of day users completing the Qualtrics survey via a tablet or QR code was 78.1% (n=215), while the response rate of overnight users completing the online survey via email was 38.7% (n=1656).

In total, 766 complete surveys were included in the analysis after 112 additional responses were removed during data cleaning for straight-lining, visitors who selected the same responses across multiple scales, and duplication, visitors who took the survey more than once. Table 1 depicts the sample size of day and overnight users included in the study based on whether respondents spent at least one night in the back of SMW. 588 respondents indicated they spent at least one night in the SMW while 178 respondents stated they did not stay overnight.

Table 1. Sample size of day and overnight users

User Type	Percentage, n = 766
Day user	178 (23.2%)
Overnight user	588 (76.8%)



Climbing Eldorado. c/o Ashley Rawhouser & Lise Grace CC BY-NC-SA 2.0

Visitor Demographics

The majority of both day and overnight users primarily reside in the United States (Table 2). Among day users, 97.0% were U.S. residents, compared to 95.8% of overnight users.

Table 2. Do you primarily reside in the United States?

User Type	U.S. Residents (%)	Not U.S. Residents (%)
Day user	162 (97.0%)	5 (3.0%)
Overnight user	503 (95.8%)	22 (4.2%)

A slightly higher percentage of overnight users (4.2%) were international visitors/groups compared to day users (3.0%). Among international overnight visitors, 15 visitors/groups traveled from Canada, three from Germany, and other individual visitors/groups traveled from France, Norway, and New Zealand. International day users visited from Canada (3), the United Kingdom (1), and Belgium (1).

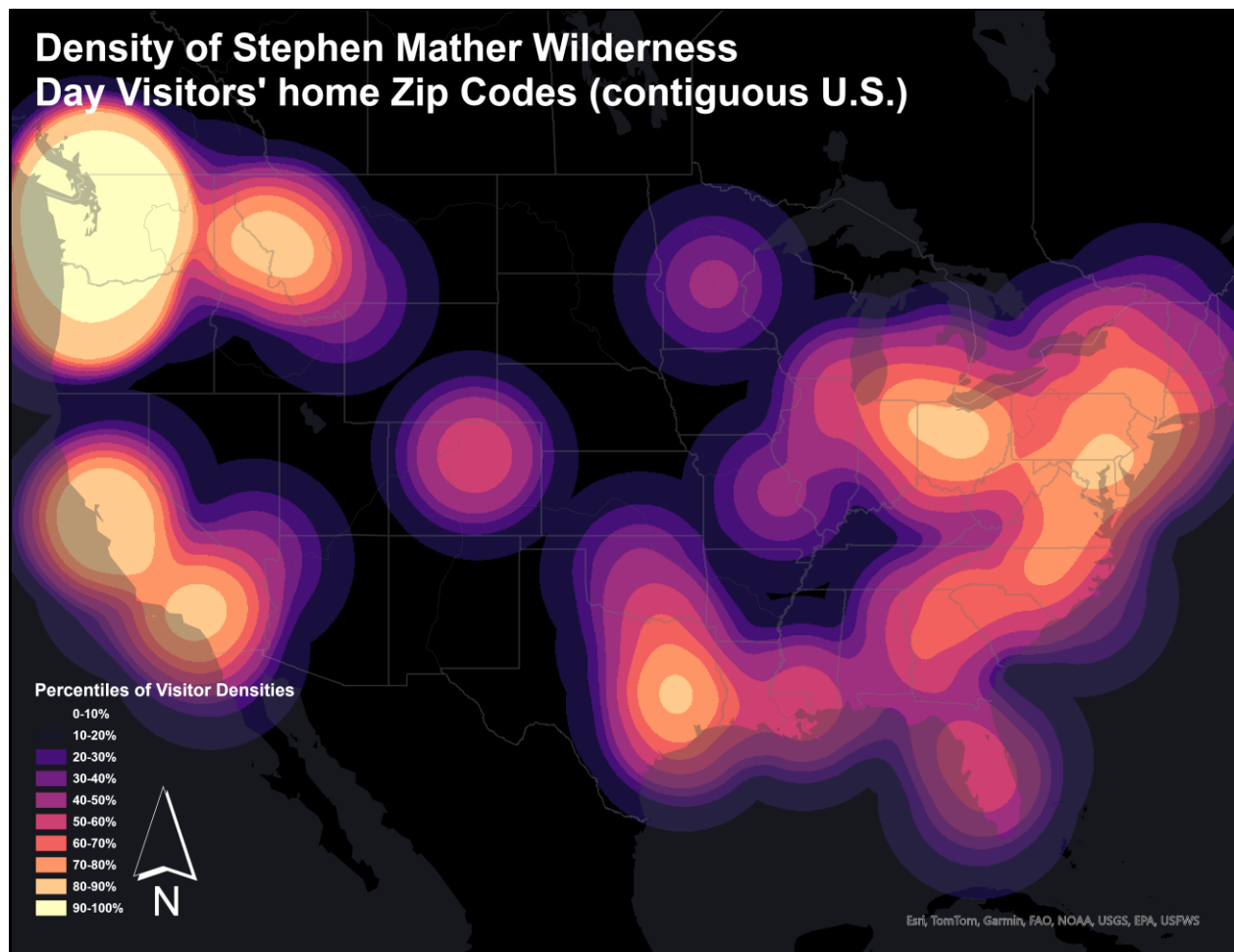


Figure 2a. Map of domestic day visitor densities and distribution within the contiguous U.S. based on home ZIP Codes.

Figure 2a (above) displays a heatmap that depicts the density of domestic day visitors' home zip codes in the contiguous U.S. A large proportion of day visitors traveled from local Washington and other nearby Pacific Northwest areas. Other frequent areas day visitors traveled from were California, the Mid-Atlantic and Great Lakes regions, and eastern Texas.

Figure 2b (below) displays a heatmap that depicts the density of domestic overnight visitors' home zip codes. The majority of overnight visitors traveled from the Pacific Northwest, particularly in Washington state, with additional hotspots in California, Colorado, and the Mid-Atlantic and Great Lakes regions.

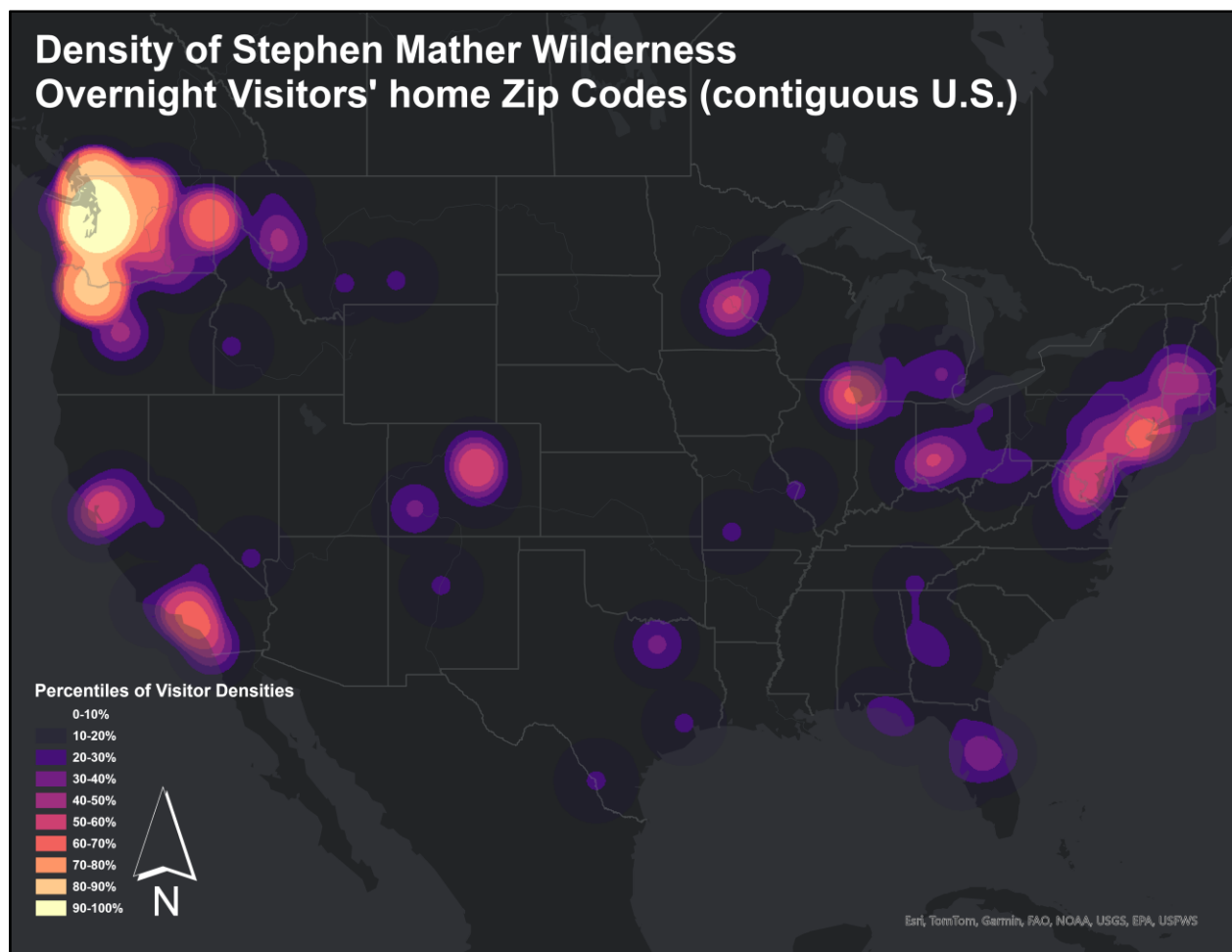


Figure 2b. Map of domestic overnight visitor densities and distribution within the contiguous U.S. based on home ZIP Codes.

The average age of day users was 40 years old with a median age of 35 (Table 3). For overnight users, the average age was also 40 years old with a median of 37. Ages for day users ranged from 22-76 years old, while ages ranged from 18 to 77 years old for overnight users.

Table 3. Age demographics among day and overnight users

User Type	Mean	Std. Deviation	Median	Minimum	Maximum
Day user	40.16	14.72	35.00	22	76
Overnight user	39.95	12.30	37.00	18	77

Annual household income of day and overnight users in the SMW is presented in Table 4. A notable portion of visitors reported household incomes of \$100,000 or more, with 66.5% of overnight users and 60.8% of day users falling into this category. This includes 22.0% of overnight users and 28.1% of day users in the \$100,000–\$149,999 range, 19.0% of overnight users and 11.8% of day users in the \$150,000–\$199,999 range, and 25.5% of overnight users and 20.9% of day users reporting incomes of \$200,000 or more.

Lower-income categories were less frequently represented. Among those earning less than \$50,000 annually, 11.1% of overnight users and 12.4% of day users fell into this range. Similarly, 9.4% of overnight users and 9.8% of day users reported household incomes between \$50,000 and \$74,999. Incomes between \$75,000 and \$99,999 were reported by 13.1% of overnight users and 17.0% of day users. In 2023, the median household income in the U.S. was \$80,610. Among day and overnight users respectively, 77.7% and 79.5% reported median household incomes at or above \$75,000.

For reference, the median household income in the U.S. in 2023 (the year with most recently available data from the U.S. Census Bureau) was \$80,610 (Guzman & Kollar, 2024). The median household income in Washington was \$94,952.

Table 4. Which category best represents your annual household income?

	Day user	Overnight user
Income categories	Percentage, n = 153	Percentage, n = 459
Less than \$25,000	6 (3.9%)	13 (2.8%)
\$25,000 to \$34,999	3 (2.0%)	16 (3.5%)
\$35,000 to \$49,999	10 (6.5%)	22 (4.8%)
\$50,000 to \$74,999	15 (9.8%)	43 (9.4%)
\$75,000 to \$99,999	26 (17.0%)	60 (13.1%)
\$100,000 to \$149,999	43 (28.1%)	101 (22.0%)
\$150,000 to \$199,999	18 (11.8%)	87 (19.0%)
\$200,000 or more	32 (20.9%)	117 (25.5%)

Table 5 presents the self-identified categories of races and/or ethnicities of day and overnight visitors. The vast majority of both day and overnight users identified as White, with 374 overnight users and 102 day users reporting this category. Few respondents identified as Asian (21 overnight, 9 day), Hispanic or Latino (12 overnight, 8 day), and American Indian or Alaska Native (8 overnight, 2

day). Black or African American representation was minimal, with 2 respondents in each user group. A small number of respondents identified as Middle Eastern or North African (2), all within the overnight user group.

Table 5. What is your race and/or ethnicity?

	Overnight User	Day User
	Frequency	Frequency
White	374	102
American	4	2
Austrian	3	0
Belarusian	0	1
Belgian	2	0
Canadian	3	0
Croatian	2	0
Czech	1	2
Danish	6	0
Dutch	5	4
Eastern European	1	0
English	159	62
Finnish	1	0
French	11	2
German	115	29
Greek	4	0
Hungarian	1	1
Irish	83	21
Italian	29	10
Latvian	2	0
Lithuanian	3	1
Mixed	3	3
Norwegian	23	5
Polish	25	10
Romanian	0	1
Russian	5	1
Scottish	38	13
Slavic	1	0
Slovak	2	0
Spanish	1	0
Swedish	14	2
Swiss	2	1
Ukrainian	2	2
West Asian	1	0
Asian	21	9
Bashkir (Russia)	1	0
Chinese	10	8
Filipino	5	0
Indian	6	7

	Overnight User	Day User
	Frequency	Frequency
Indonesian	0	1
Japanese	2	2
Korean	3	0
Nepali	1	0
Taiwanese	2	0
Vietnamese	2	1
Hispanic or Latino	12	8
Brazilian	0	1
Columbian	1	1
Guatemalan	0	1
Mexican	9	4
Salvadoran	0	2
Spanish	2	1
American Indian or Alaska Native	8	2
Blackfeet, Navajo, Dungeness	1	0
Brothertown	0	1
Cherokee	2	0
Navajo	1	0
Shawnee	1	0
Black or African American	2	2
African American	0	3
Haitian	1	0
Jamaican	1	0
Somali	0	1
Middle Eastern or North African	2	0
Iranian	1	0
Lebanese	2	0

Group Characteristics

Group size among day and overnight users were similar, with the average group size being 2.33 individuals and 2.48 individuals, respectively (Table 6a). The median group size was 2 individuals, which was the same for both day and overnight users. Overnight users had the largest group, consisting of 24 people, compared to day users, whose largest group was 15 people.

Table 6b depicts the group composition of both day and overnight visitors in the SMW. The majority of both day (96.6%) and overnight (95.8%) visitors were not with an organized group. However, more overnight users (2.9%) visited with organizations, such as the Mountaineers or Boeing Employees Alpine Society (BOEALPS), compared to day users (1.1%). Other group types, such as research or other non-specified groups, were minimally represented across both user types. Notably, a small portion of overnight users (0.9%) traveled with a commercially guided group, while no day users reported doing so. Because administrative and commercial use permits were filtered out from the permit data sent by the park, only non-commercial overnight users were contacted to participate

in the study. This suggests that those who reported traveling with commercially guided groups might have been with an unauthorized commercially guided trip.

Table 6a. How many people were in your group, including you?

User Type	Mean	Median	Std. Deviation	Maximum
Day user	2.33	2	1.66	15
Overnight user	2.48	2	1.70	24

Table 6b. Do any of the following describe your group you are traveling with?

	Day user	Overnight user
Group Type	Percentage, n = 174	Percentage, n = 577
Not with an organized group	168 (96.6%)	553 (95.8%)
Other (specify) ¹	2 (1.1%)	1 (0.2%)
Research group	2 (1.1%)	1 (0.2%)
Club/organization/school (specify) ²	2 (1.1%)	17 (2.9%)
Commercially guided group	0 (0%)	5 (0.9%)

¹Other was not specified for any of these groups.

²Club/organization/school includes The Mountaineers and other mountaineering clubs (n = 7), BOEALPS (n = 2), and meetup groups (n = 2).

Stephen Mather Wilderness Experience

Table 7 describes the activities that visitors reported participating in on their current trip to the SMW. Both day and overnight visitors reported (a) the primary activity they participated in and (b) any other additional activities they participated in within the same trip. On-trail hiking was the dominant primary activity for day users (85.9%), whereas overnight users most commonly reported backpacking as their primary activity (72.2%). Day users also participated in on-trail hiking at a higher frequency (91.6%) compared to overnight users (66.2%), while overnight users reported significantly higher participation in backpacking (87.8%) and mountaineering/alpine climbing (25.5%) than day users (14% and 5.1%, respectively). More overnight users engaged in off-trail hiking (20.1%), night sky viewing (26.9%), and wildlife viewing (28.2%), which were less common activities reported among day users. Other activities, such as trail running, photography/videography, and paddling, showed relatively low participation across both groups, though overnight users reported higher engagement overall.

Table 7. Below is a list of activities available in the Stephen T. Mather Wilderness. Please indicate: (A) which one of these activities was your primary activity during this visit, and (B) which of these activities you have participated in during this visit.

Activity	A. Primary Activity		B. Frequency of Participation	
	Day user	Overnight user	Day user	Overnight user
	Percentage, n = 170	Percentage, n = 553	Percentage, n = 178	Percentage, n = 588
On-trail hiking	146 (85.9%)	16 (2.9%)	163 (91.6%)	389 (66.2%)
Backpacking	10 (5.9%)	399 (72.2%)	25 (14%)	516 (87.8%)
Mountaineering/Alpine climbing	5 (2.9%)	108 (19.5%)	9 (5.1%)	150 (25.5%)
Trail running	3 (1.8%)	2 (0.4%)	12 (6.7%)	32 (5.4%)
Photography/Videography	2 (1.2%)	3 (0.5%)	49 (27.5%)	174 (29.6%)
Paddling/Kayaking/Canoeing/Pack rafting	1 (0.6%)	17 (3.1%)	3 (1.7%)	32 (5.4%)
Off-trail hiking	1 (0.6%)	2 (0.4%)	7 (3.9%)	118 (20.1%)
Night sky viewing	1 (0.6%)	0 (0%)	8 (4.5%)	158 (26.9%)
Recreational fishing	0 (0%)	3 (0.5%)	3 (1.7%)	28 (4.8%)
Guided hike or climb	0 (0%)	1 (0.2%)	0 (0%)	2 (0.3%)
Other (specify) ¹	0 (0%)	2 (0.4%)	4 (2.2%)	26 (4.4%)
Stock packing	0 (0%)	0 (0%)	1 (0.6%)	2 (0.3%)
Horseback riding	0 (0%)	0 (0%)	1 (0.6%)	1 (0.2%)
Wildlife viewing	0 (0%)	0 (0%)	42 (23.6%)	166 (28.2%)

*Visitors were asked to select all activities that apply so percentages may not equal 100%.

¹Respondents were asked to specify the activities they participated in that were not listed. Other primary activities included fastpacking. Frequently reported additional activities were swimming, camping, and mushroom hunting.

Regarding primary activities, visitors were also asked to define their relationship and experience with their selected activity (Table 8). Both day (53.7%) and overnight users (61.7%) dominantly identified with being a “Committed Recreationist” where they aligned themselves with the statement, “I have participated in this activity many times before and I love to do it. I came to this area to participate in this activity and go to similar destinations for the same reason. I have extensive knowledge about how to participate in this activity and associated rules and regulations.” Of the remaining day and overnight users, a majority identified as “Active Recreationist,” (49.2% day; 31.5% overnight users) and very few identified with either “Passionate New Recreationist” (1.7% day; 5.8% overnight) or “New Recreationist” (1.7% day; 1.0% overnight).

A chi-square test was used to compare these relationships between day and overnight users, and the results suggest that there is a statistically significant difference commitment between groups (Pearson chi-square = 11.589, df = 3, p = .009)

Table 8. Which of the following statements best defines your relationship to your primary activity? (i.e., commitment to activity)

	Day user	Overnight user
Commitment to activity	Percentage, n = 175	Percentage, n = 572
New recreationist - "This is the first time I participated in this activity in a setting like this. I do not know a lot about this activity. I am participating to spend time with my friends/family or to have a new experience. I do not travel to destinations specifically to participate in this activity."	3 (1.7%)	6 (1.0%)
Passionate new recreationist - "This is one of the first times I participated in this activity in a setting like this, but I had already some knowledge about it. Participating in this activity would be one reason to come back to this area or travel to a similar area in the future."	3 (1.7%)	33 (5.8%)
Active recreationist - "I have participated in this activity before. This is an outdoor activity that I appreciate a lot. I have considerable knowledge about this activity and participating in this activity would be one reason to come back to this area or travel to a similar area in the future."	75 (49.2%)	180 (31.5%)
Committed recreationist - "I have participated in this activity many times before and I love to do it. I came to this area to participate in this activity and go to similar destinations for the same reason. I have extensive knowledge about how to participate in this activity and associated rules and regulations."	94 (53.7%)	353 (61.7%)

Table 9 displays descriptive statistics for the number of nights overnight users spent in the SMW. On average, overnight visitors spent 1.96 nights with little variation ($SD = 1.22$). The median duration of stay was 2 nights, and trips ranged from 1 to 9 nights, reflecting some variability in the length of overnight stays.

Day users were asked to report the number of hours they spent in the wilderness area on this current trip (Table 10). With significant variation ($SD = 8.96$), day users spent an average of 8.04 hours. The median length of stay was 6 hours, and the total amount of time spent in the SMW ranged from 0.25 to 48 hours among all day users. Day visitors reporting higher numbers of hours spent in the SMW during their trip may have slept outside of the wilderness and then made multiple trips into the SMW throughout their stay adding up to a cumulative 48 hours.

Table 9. How many nights did you spend in the Stephen T. Mather Wilderness on this trip? (Overnight visitors only)

n = 577	Mean	Std. Deviation	Median	Minimum	Maximum
Number of nights	1.96	1.22	2.00	1.00	9.00

Table 10. How many hours did you spend in the Stephen T. Mather Wilderness on this trip? (Day visitors only)

n = 175	Mean	Std. Deviation	Median	Minimum	Maximum
Number of hours	8.04	8.96	6.00	0.25	48

Overnight visitors were asked if they stopped by the Wilderness Information Center (WIC) to pick up their overnight permits (Table 11). A majority of overnight visitors (84.6%) did stop at the WIC to pick up their overnight permits, while only 15.4% did not. This small percentage of people who did not visit the WIC to pick up their permits could partially be due to the Good Stewards Program that NOCA Complex used this year to encourage frequent backcountry users to print their advanced reservations online and therefore would not need to visit the WIC for their permit.

Table 11. Did you stop into the wilderness information center (WIC) to pick up your overnight permit?

Percentage, n = 577	
Yes	488 (84.6%)
No	89 (15.4%)

Table 12 demonstrates differences in awareness of recreating within the boundaries of the federally designated SMW between day and overnight users. A significantly higher proportion of overnight users (55.1%) were aware of being in a designated Wilderness area compared to day users (38.4%). It is important to note that 44.9% of wilderness campers were unaware that they were camping within a wilderness area. Results from a chi-square test ($\chi^2 = 15.177$, $df = 1$, $p < .001$) indicate that this difference is statistically significant, suggesting that overnight users have a greater awareness of designated wilderness boundaries than day users.

Table 12. Before taking this survey, were you aware that you were recreating within the boundaries of the federally designated Stephen T. Mather Wilderness area during this trip?

User Type	Aware of recreating in Wilderness (%)	Unaware of recreating in Wilderness (%)
Day user	68 (38.4%)	109 (61.6%)
Overnight user	323 (55.1%)	263 (44.9%)

All visitors were asked to report the year of their first visit to the SMW. The number of years since their first visit was calculated by subtracting the year of their first visit from 2024; Table 13 presents the descriptive statistics from this calculation. The maximum number of years since first visit for day users was 64 years, while the maximum for overnight users was only 39 years. The results of an independent samples t-test reveal that on average, overnight users ($M = 6.82$, $SD = 10.98$) had a significantly higher number of years since their first visit than day users ($M = 4.21$, $SD = 8.75$), though the magnitude of this difference was small ($t = 3.22$, $p = .001$, mean difference = 2.60 years, Cohen's $d = .25$).

Table 13. Number of years since first visit among day and overnight users

User Type	n	Mean	Median	Std. Deviation	Maximum
Day user	173	4.21	0	8.75	64
Overnight user	571	6.82	2	10.98	39

Table 14 illustrates the seasonal visitation patterns of day and overnight users in the SMW. Summer (June–August) was the most popular season for both groups, with 66.9% of day users and 86.9% of overnight users visiting during this time. Fall (September–November) also saw significant use, with 67.4% of day users and 53.9% of overnight users reporting visits. While day users had lower visitation during winter (3.9%) and spring (18.0%), overnight users were more likely to visit during these seasons, with 11.6% visiting in winter and 26.7% in spring. This suggests that overnight users may have a broader seasonal distribution compared to day users, particularly in the shoulder and winter seasons.

Table 14. What seasons do you visit [the SMW] throughout the year? (Select all that apply*)

Season of Use	Day user	Overnight user
	Percentage, n = 178	Percentage, n = 588
Summer (June – August)	119 (66.9%)	511 (86.9%)
Fall (September – November)	120 (67.4%)	317 (53.9%)
Winter (December – March)	7 (3.9%)	68 (11.6%)
Spring (April – May)	32 (18.0%)	157 (26.7%)

*Visitors were asked to select multiple seasons if applicable so percentages may not equal 100%.

When planning their trip to the SMW, the majority of both day (67.4%) and overnight users (78.7%) reported using the NPS park website (Table 15). Recreation.gov was also a widely used resource, with 72.8% of overnight users relying on it to plan their trips, compared to 38.8% of day users. This difference is likely because overnight visitors are required to use Recreation.gov to secure permits, whereas day visitors may not need this resource for planning their day trips.

In addition, 46.6% of day users and 52.7% of overnight users reported referencing other websites or apps, such as the Washington Trails Association (WTA), AllTrails, Gaia GPS, or CalTopo, to plan their trips. Other sources, including physical maps, guidebooks, and word of mouth, were similarly used by both groups (23.6% of day users and 22.3% of overnight users). Fewer visitors reported utilizing the National Park Service (NPS) social media accounts or commercial guides, highlighting their relatively minor role in trip planning for both day and overnight visitors compared to other sources of information.

Table 15. Prior to your arrival, what sources of information did you and your group use to plan your trip?

Source of information	Day user	Overnight user
	Percentage, n = 178	Percentage, n = 588
Park website (NPS.gov)	120 (67.4%)	463 (78.7%)
Other websites/social media/app (specify) ¹	83 (46.6%)	310 (52.7%)
Recreation.gov	69 (38.8%)	428 (72.8%)
Other (specify) ²	42 (23.6%)	131 (22.3%)
NPS social media accounts	25 (14.0%)	64 (10.9%)
Commercial guide/concessionaire	5 (2.7%)	7 (1.2%)

*Visitors were asked to select multiple sources of information if applicable so percentages may not equal 100%.

¹Visitors were asked to specify which websites, social media, or apps they used. Frequently reported online sources were AllTrails, the Washington Trails Association's website (wta.org), Gaia GPS, and CalTopo.

²Visitors were asked to specify which sources they used that were not listed. Frequently reported sources were physical maps, books, and word of mouth.

Wilderness Experience Quality

Day and overnight visitors were asked about various problems they may have experienced in the SMW on their trip (Table 16). Most of these issues were regarded as not being a problem at all during visitors' trips in the SMW. 80.2% of overnight users and 84.7% of day users reported toilet paper and human waste as not a problem at all; only 6 individual overnight users and 1 individual day user reported this as a serious problem. 97.7% and 98.6% of overnight and day users, respectively, stated that the presence of scientific monitoring stations and equipment was not a problem at all. Regarding the noise from motorized use like chainsaws and helicopters, the majority of overnight users (78.5%) and day users (87.2%) stated it was not a problem at all. 21.5% of overnight users and 12.8% of day users stated motorized noise was either a slight or moderate problem encountered on their trip.

Table 16. The following items are problems you may have run into on your visit to the Stephen T. Mather Wilderness. Please indicate how much of a problem each item was for you.

	Day user	Overnight user
	Frequency (%)	Frequency (%)
Toilet paper and human waste	<i>n</i> = 144	<i>n</i> = 541
Not a problem at all	122 (84.7%)	434 (80.2%)
Slight problem	19 (13.2%)	86 (15.8%)
Moderate problem	2 (1.4%)	15 (2.8%)
Serious problem	1 (0.7%)	6 (1.1%)
Presence of scientific monitoring stations, wildlife cameras, radio towers, other installations and developments	<i>n</i> = 138	<i>n</i> = 513
Not a problem at all	136 (98.6%)	501 (97.6%)
Slight problem	1 (0.7%)	12 (2.3%)
Moderate problem	1 (0.7%)	0 (0%)
Serious problem	0 (0%)	0 (0%)
Noise from motorized use such as chainsaws and helicopters	<i>n</i> = 149	<i>n</i> = 530
Not a problem at all	130 (87.2%)	416 (78.5%)
Slight problem	18 (12.1%)	95 (17.9%)
Moderate problem	1 (0.7%)	19 (3.6%)
Serious problem	0 (0%)	0 (0%)

SMW visitors were also asked about potential conditions they experienced during their day or overnight trip that may have impacted their opportunities for solitude in the wilderness (Table 17). Using a scale from -2 = strongly detracted to +2 = strongly added, with 0 = being no impact, both day and overnight visitors stated that hearing and seeing visitors on the trail and/or while camping had a very slightly negative impact on their experience for solitude, on average. Alternatively, both day and overnight users reported having a visitor capacity for wilderness camping had a slightly positive impact on their wilderness experience (Day: *M* = 0.27, *SD* = 1.04; Overnight: *M* = 0.71, *SD* = 1.17).

An independent samples t-test was conducted to compare the average responses to these conditions between day and overnight users. Results suggest that having a visitor capacity for designated camping added to overnight users' opportunities for solitude more significantly than day users' with a minimal to typical effect size (*t* = 3.71, *p* < .001, mean difference = 0.44, Cohen's *d* = 0.39).

Table 17. How much did the following conditions add to (or detract from) your opportunities for solitude in the Stephen Mather Wilderness?

	Day user n = 76	Overnight user n = 499
	Mean (St. Deviation)	Mean (St. Deviation)
Hearing and seeing visitors on the trail	-0.11 (0.95)	-0.12 (0.71)
Hearing and seeing visitors while camping	-0.17 (0.73)	-0.22 (0.66)
Having a visitor capacity (limited permits) for designated campsites and cross-country zones	0.27 (1.04)	0.71 (1.17)

Scale: -2 = strongly detracted, -1 = slightly detracted, 0 = had no impact, 1 = slightly added, 2 = strongly added.

Wilderness Values and Motivations

Visitors were asked to state their perspectives on commercially guided trips into the SMW (Table 18). Regarding the ability for commercial guides to provide more accessible opportunities to the wilderness, both day (M = 0.60, SD = 0.91) and overnight visitors (M = 0.71, SD = 0.86) slightly agreed. When asked if there are too many guided trips and outfitters in the wilderness, day (M = -0.15, SD = 0.82) and overnight visitors (M = -0.07, SD = 0.86) slightly disagreed. All visitors agreed that guided trips help visitors follow appropriate behaviors in the wilderness (Day: M = 0.68, SD = 0.92; Overnight: M = 0.78, SD = 0.82).

Table 18. Please indicate your level of agreement or disagreement with each of the following statements regarding guides and guided trips.

	Day user n = 164	Overnight user n = 519
	Mean (St. Deviation)	Mean (St. Deviation)
Guides provide opportunities for people to access the wilderness that would not otherwise be possible.	0.60 (0.91)	0.71 (0.86)
There are too many guided trips and outfitters in the wilderness.	-0.15 (0.82)	-0.07 (0.86)
Guided trips help support appropriate behaviors of visitors in the wilderness.	0.68 (0.92)	0.78 (0.82)

Scale: -2 = strongly disagree, -1 = disagree, 0 = neutral, 1 = agree, 2 = strongly agree.

Day and overnight visitors were also asked questions regarding their level of place attachment to SMW (Table 19). All users agreed that SMW is the best place to recreate for the specific kinds of activities they like to participate in (Day: M = 1.02, SD = 0.81; Overnight: M = 0.96, SD = 0.84). Both day and overnight visitors slightly agreed that no other place can compare to SMW and that they would not substitute any other place for the recreation activities they do in SMW. Compared to other National Parks in the Pacific Northwest, both day (M = 0.71, SD = 1.08) and overnight visitors (M = 0.93, SD = 1.06) agreed, on average, that the North Cascades should be the least developed and most challenging to access.

Table 19. Day and overnight users' perspectives on place attachment with SMW.

	Day user n = 168	Overnight user n = 540
	Mean (St. Deviation)	Mean (St. Deviation)
This is the best place for the activities I like to do.	1.02 (0.81)	0.96 (0.84)
No other place can compare to this place.	0.38 (1.12)	0.64 (1.10)
I wouldn't substitute any other place for the recreation activities I do in this place.	0.09 (1.09)	0.23 (1.09)
Compared to other National Parks in the Pacific Northwest, North Cascades should be the least developed and the most challenging to access.	0.71 (1.08)	0.93 (1.06)

Scale: -2 = strongly disagree, -1 = disagree, 0 = neutral, 1 = agree, 2 = strongly agree.

Within the survey, all visitors were asked to rate how true 15 potential indicators were as the various motivations for their visit to the SMW on a Likert scale from 1 = not at all true to 5 = completely true. An example of one motivation indicator included in the survey was "In planning and during my trip to the SMW, I was motivated to gain a greater sense of self-reliance through challenge." See Table 20a for the full battery of motivation indicators that were included in the survey.

A confirmatory factor analysis (CFA) was completed for day and overnight visitors separately. Table 20a presents CFA results for overnight visitors only. Standardized loadings ranged from 0.60 to 1.16, demonstrating strong relationships between most indicators and their corresponding latent constructs. Descriptive statistics revealed that on average, overnight users were most likely to be motivated by their desire to connect with nature ($M = 4.13$, $SD = 0.87$) and seek solitude in the wilderness ($M = 4.11$, $SD = 0.83$). The challenge of wilderness ($M = 3.28$, $SD = 1.14$), the opportunity to bond socially with others ($M = 3.03$, $SD = 1.18$) and the opportunity for unconfined recreation within wilderness ($M = 2.93$, $SD = 1.16$) were moderately true; however, were all less influential motivators for overnight users during their trip in the SMW.

Table 20b displays CFA results for day users only. Similarly to overnight users, day users were also most strongly motivated by their connection to nature ($M = 4.30$, $SD = 0.73$) and desire for solitude ($M = 4.00$, $SD = 0.82$). Motivations related to challenge ($M = 3.01$, $SD = 1.08$), social bonding ($M = 3.03$, $SD = 1.17$), and unconfined experiences ($M = 2.67$, $SD = 1.10$) played a more moderate or secondary role during their trip.

An independent sample t-test reveals significant differences in motivators related to challenge, nature, and unconfined recreation between overnight and day users. On average, overnight users rated challenge (Cohen's $d = 0.24$) and unconfined recreation (Cohen's $d = 0.21$) as higher motivators than day users, although these significant differences had minimal effect sizes. Day users rated nature as a higher motivator than overnight users, also with a minimal effect size (Cohen's $d = -0.20$).

Table 20a. Reliability and descriptive statistics of motivations for overnight users only.

Motivation	Indicator	Std. Estimate (lv)	Statistics	
			Mean	Std. Deviation
Challenge			3.28	1.14
	...gain a greater sense of self-reliance through challenge.	1.09	3.31	1.17
	...to see what I am capable of doing.	1.14	3.28	1.20
	...to test my abilities through challenge.	1.10	3.27	1.21
	<i>Cronbach's Alpha (α)</i>	0.95		
Social			3.03	1.18
	...strengthen family or social bonds.	1.14	3.12	1.39
	...be with people who share similar values.	1.15	3.40	1.30
	...increase my sense of belonging with others.	1.02	2.58	1.30
	<i>Cronbach's Alpha (α)</i>	0.86		
Nature			4.13	0.86
	...enjoy the sounds of nature.	0.73	4.20	0.94
	...get to know the environment.	0.85	4.07	0.98
	...cultivate a closer relationship with the natural world.	0.88	4.14	0.98
	<i>Cronbach's Alpha (α)</i>	0.88		
Solitude			4.11	0.83
	...to experience life without everyday technologies.	0.87	3.96	1.08
	...to be in an environment mostly free of human-made intrusions.	0.73	4.09	0.97
	...be away from crowds of people.	0.60	4.26	0.96
	<i>Cronbach's Alpha (α)</i>	0.78		
Unconfined			2.93	1.16
	...experience minimal rules.	1.00	2.72	1.35
	...roam wherever I want.	1.16	2.71	1.38
	...make my own plans.	1.05	3.37	1.24
	<i>Cronbach's Alpha (α)</i>	0.83		

Scale: 1 = not at all true, 2 = slightly true, 3 = moderately true, 4 = very true, 5 = completely true.

Table 20b. Reliability and descriptive statistics of motivations for day users only.

Motivation	Indicator	Std. Estimate (lv)	Statistics	
			Mean	Std. Deviation
Challenge			3.01	1.08
	...gain a greater sense of self-reliance through challenge.	0.94	2.95	1.11
	...to see what I am capable of doing.	1.16	3.05	1.20
	...to test my abilities through challenge.	1.01	3.05	1.19
	<i>Cronbach's Alpha (α)</i>	0.92		
Social			3.03	1.17
	...strengthen family or social bonds.	0.96	3.10	1.37
	...be with people who share similar values.	1.13	3.25	1.29
	...increase my sense of belonging with others.	1.16	2.76	1.33
	<i>Cronbach's Alpha (α)</i>	0.86		
Nature			4.30	0.73
	...enjoy the sounds of nature.	0.41	4.44	0.68
	...get to know the environment.	0.81	4.20	0.88
	...cultivate a closer relationship with the natural world.	0.82	4.28	0.90
	<i>Cronbach's Alpha (α)</i>	0.85		
Solitude			4.00	0.82
	...to experience life without everyday technologies.	0.69	3.90	1.09
	...to be in an environment mostly free of human-made intrusions.	0.76	4.04	1.00
	...be away from crowds of people.	0.61	4.06	1.03
	<i>Cronbach's Alpha (α)</i>	0.69		
Unconfined			2.69	1.10
	...experience minimal rules.	1.02	2.55	1.30
	...roam wherever I want.	1.05	2.27	1.31
	...make my own plans.	0.92	3.24	1.30
	<i>Cronbach's Alpha (α)</i>	0.81		

Scale: 1 = not at all true, 2 = slightly true, 3 = moderately true, 4 = very true, 5 = completely true.

Visitor Use Management Perspectives

Day and overnight visitors were asked to consider multiple rationing techniques or ways in which SMW campsites could be distributed to potential users. Table 21 displays descriptive statistics of day and overnight users support for each rationing method on a scale of -2 = strongly oppose to +2 = strongly support, with 0 = neutral. On average, respondents generally supported or remained neutral concerning the various rationing methods, other than increasing the fee or cost for campsite reservations, which received a more negative response from both day (-0.27, SD = 1.01) and overnight users (M = -0.44, SD = 1.09). Day users were most in favor of using a combination of rationing techniques (M = 0.97, SD = 0.98) and a combination of timeframes or booking windows to release campsite reservations (M = 0.81, SD = 1.11). Overnight users had similar responses; they showed strong preference for the combination of techniques (M = 1.13, SD = 0.90), followed by a combination of timeframes (M = 0.99, SD = 1.02) and online advanced reservations (M = 0.77, SD = 0.96).

Table 21. Please rate your support for the following techniques of distributing (or rationing) campsites in the SMW.

Rationing Technique	Day user	Overnight user
	n = 168	n = 529
	Mean (St. Deviation)	Mean (St. Deviation)
First-come, first-served (i.e. the first arrive get campsites)	0.32 (1.14)	0.12 (1.14)
Increasing the fee/cost for reserving a campsite	-0.27 (1.01)	-0.44 (1.09)
Online advance reservations (i.e., reservations on Recreation.gov)	0.67 (1.03)	0.77 (0.96)
Online lottery (i.e., an advance lottery on Recreation.gov)	-0.07 (1.15)	0.16 (1.14)
Combination of techniques (e.g., 50% reservation and 50% first come, first served)	0.97 (0.98)	1.13 (0.90)
Combination of timeframes (e.g., 25% available 6 months-in-advance, 50% available 1 month-in-advance, 25% available first come, first served on the day of arrival)	0.81 (1.11)	0.99 (1.02)

Scale: -2 = strongly oppose, -1 = oppose, 0 = neutral, 1 = support, 2 = strongly support.

Tables 22a and 22b summarize the preferred and maximum booking windows for backcountry camping permits among day and overnight users in the SMW.

Day users reported a preferred booking window of approximately 1.59 months on average (SD = 1.76, median = 1 month), with responses ranging from 0 to 8 months. Their maximum booking window—the longest period they can plan in advance—averaged 3.72 months (SD = 3.96, median = 3 months), with a wide range from 0 to 32 months.

Overnight users showed similar preferences, with a slightly lower average preferred booking window of 1.49 months (SD = 1.73, median = 1 month) and a range of 0 to 12 months. Their maximum

booking window was comparable to day users, with an average of 3.79 months (SD = 3.08, median = 3 months) and a range from 0 to 24 months.

Table 22a. Preferred and maximum booking windows among day users in number of months

	n	Mean	Std. Deviation	Median	Minimum	Maximum
What is your preferred booking window (i.e., the optimal amount of days, weeks, or months campsite reservations are available prior to arrival) for a backcountry camping permit in the SMW?	114	1.59	1.76	1.00	0.00	8.00
What is your maximum booking window (i.e., the maximum amount of days, weeks, or months you are able to plan in advance prior to arrival) for a backcountry camping permit in the SMW?	115	3.72	3.96	3.00	0.00	32.00

Table 22b. Preferred and maximum booking windows among overnight users in number of months

	n	Mean	Std. Deviation	Median	Minimum	Maximum
What is your preferred booking window (i.e., the optimal amount of days, weeks, or months campsite reservations are available prior to arrival) for a backcountry camping permit in the SMW?	493	1.49	1.73	1.00	0.00	12.00
What is your maximum booking window (i.e., the maximum amount of days, weeks, or months you are able to plan in advance prior to arrival) for a backcountry camping permit in the SMW?	490	3.79	3.08	3.00	0.00	24.00

The permit data that NOCA wilderness staff sent weekly included the dates that permits were ordered through Recreation.gov as well as the dates that the overnight visitors entered the backcountry. This information allowed actual booking windows, or the amount of lapsed time between booking their SMW backcountry permits and their participation in wilderness camping, to be examined. During the study period, 31.6% of overnight visitors (183 out of 579) made day-of, or walk-up, reservations for their overnight trip in the SMW, and 14.5% of overnight visitors (84 out of 579) made their reservations only one day in advance. On average, overnight visitors made reservations for their SMW trip 37 days in advance (SD = 53 days, median = 2 days). The earliest an overnight visitor made a reservation for their SMW was 195 days, and only one visitor booked this far in advance.

The actual booking windows were then compared to overnight SMW visitors' preferred booking windows. The average difference between preferred booking windows and how far in advance these visitors made their overnight reservations was -8 days (SD = 55 days, median = -6.6 days). A negative difference here indicates that many visitors were able to reserve their permits within their

preferred booking window. 59.05% of overnight visitors were able to reserve their permits closer to their trip date, while 40.95% of visitors were unable to reserve their permits within their preferred booking window, and therefore had to reserve their permit earlier than they would have preferred. The maximum difference between when a visitor had to reserve their permit earlier than they preferred was 195 days before their preferred booking window.

Spearman rank-order correlation tests were also conducted to determine if there were statistically significant relationships between actual booking windows and overnight SMW visitors' preferred and maximum booking windows. Significant positive relationships were revealed for both preferred ($r_s = .54$, $p < .001$), and maximum booking windows ($r_s = .41$, $p < .001$), at the 99% confidence level. This suggests that as overnight visitors' actual booking windows increased, their preferred and maximum booking windows also increased.

Additional Spearman rank-order correlation tests were then conducted to determine if there were statistically significant relationships between actual booking windows and preferences for the various rationing techniques for distributing campsites in the SMW (Table 21). At the 99% confidence level, significant, positive relationships were identified for the advanced reservation ($r_s = .33$, $p < .001$) and online lottery ($r_s = .31$, $p < .001$) techniques, while significant, negative relationships were identified for the first-come, first-serve ($r_s = -.28$, $p < .001$) technique. This suggests that as overnight visitors' actual booking window increased, they were more likely to support reservations and online lotteries and less likely to support first-come, first served systems.

Visitors were asked to report their interest in the potential use of a transit (bus) service to major destinations in the North Cascades National Park Complex (Table 23). A majority of both day (61.9%) and overnight (60.7%) users reported being "not at all likely" or "slightly likely" to use such a service. Slightly more overnight users indicated they were "very likely" (9.2%) or "extremely likely" (10.9%) to use the transit service, compared to day users (7.1% and 4.8%, respectively). The distribution of day users' and overnight users' support is depicted in Figures 3a and 3b, respectively. These figures demonstrate that visitors are overall less likely to support a transit service throughout the NOCA Complex.

Table 23. If you were to visit North Cascades National Park in the future, if a transit (bus) service existed, with service to the park's major destinations, how likely would it be that you would use such a service?

	Day user	Overnight user
	Percentage, n = 42	Percentage, n = 448
Not at all likely	16 (38.1%)	157 (35.0%)
Slightly likely	10 (23.8%)	115 (25.7%)
Moderately likely	11 (26.2%)	86 (19.2%)
Very likely	3 (7.1%)	41 (9.2%)
Extremely likely	2 (4.8%)	49 (10.9%)

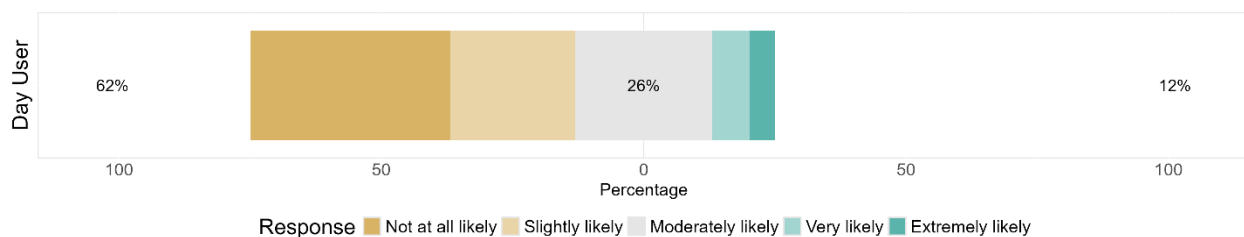


Figure 3a. Distribution of day users' support for using a transit (bus) service to travel through North Cascades National Park.

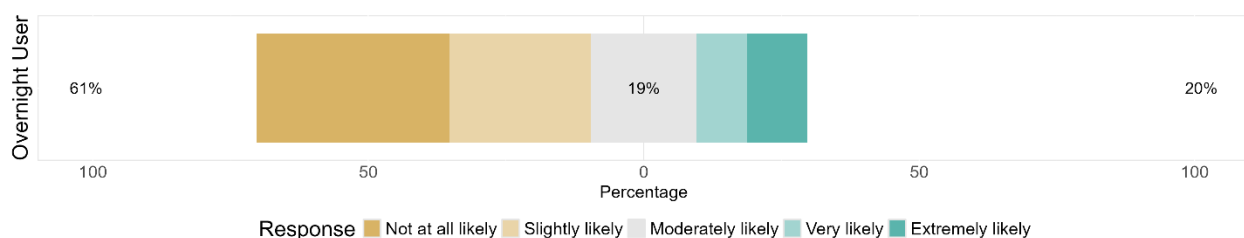


Figure 3b. Distribution of overnight users' support for using a transit (bus) service to travel through North Cascades National Park.

Visitors who reported “not at all likely” or “slightly likely” to the question above were asked to explain why, resulting in 280 open ended responses. Day visitors expressed a variety of reasons such as their desires for freedom and flexibility in using personal vehicles and being able to travel on their own schedule. Concerns about being tied to a bus schedule included the time window bus operation, the limited number and location of stops on route, and the general inconvenience of waiting around for buses to pick up. Many were deterred by the perception that a bus service could lead to overcrowding, likening it to other parks with heavy bus use, and expressed a preference for seeking less crowded or popular areas within the park that had fewer people. Other frequently mentioned concerns were about the impracticality of carrying personal items like food, supplies, or the necessary hiking, camping, and/or climbing gear on the bus. Few visitors highlighted the importance of having personal vehicles to ensure their ease of movement, their ability to reach more remote areas of the park, and for other health related concerns like carsickness.

Overnight visitors shared similar concerns about a potential transit service, reiterating the need for personal vehicles due to the logistical demands of their trips and the remote nature of the park. A common sentiment was a preference to avoid bus schedules, which could limit their independence and freedom to come and go as they please. Many noted that they travel long distances to reach the park and rely on their cars for flexibility in accessing trailheads, carrying gear, and making multiple stops along the way. Concerns about ability to access more remote areas of the park, maintaining solitude, and avoiding large groups of people were frequently mentioned. Others expressed

apprehension about the additional infrastructure that would be needed in the park to support a shuttle service.

Wilderness Management Perspectives

Wilderness stewardship frequently requires navigating trade-offs between maximizing often-competing qualities of wilderness character. Improving one quality may have a negative impact on other qualities. Both day and overnight visitors were given the same set of three trade-off scenarios to evaluate their support for various wilderness management actions on a scale of -2 = strongly opposed to +2 = strongly support, with 0 = neutral. Cronbach's alpha coefficients were calculated to determine the reliability of each indicator measuring the same wilderness character trade-off in each scenario. Descriptive statistics were then calculated to measure visitors' general levels of support for each management action.

In the first scenario, visitors were asked to consider increased human impacts on natural conditions in SMW and to rate their support for management actions that balance the confinement of recreational experiences with the installation of permanent developments in the SMW:

Scenario 1: Stephen T. Mather Wilderness (SMW) managers face a choice between transporting permanent developments and installations using helicopters (both generally prohibited in wilderness but allowed if deemed necessary) and increased human impacts to natural conditions.

Table 24 depicts the results of descriptive statistics for both day and overnight users as well as Cronbach's alpha coefficients. The resulting Cronbach's alphas for both day (0.64) and overnight users (0.75) suggest internal reliability of each indicator adequately measuring the same construct of the scale between confinement and development. Generally, both day and overnight users expressed feeling neutral to supportive of both development and recreation confinement in the SMW, on average. This suggests that on average, both day and overnight users prioritize reducing human impacts to the natural conditions in wilderness over management that prioritizes unconfined and undeveloped characteristics of wilderness. The distribution of day users' and overnight users' support is depicted in Figures 4a and 4b, respectively

Table 24. Descriptive statistics of SMW users' support for trade-off 1 management actions and reliability of indicators.

	Day user	Overnight user
Trade-off 1 Indicators	Mean (Std. Deviation)	Mean (Std. Deviation)
Install metal wildlife-resistant food storage boxes using helicopters rather than requiring campers to hang food or carry bear cans.	0.34 (1.17)	0.46 (1.33)
Require campers to hang food or carry bear cans in wilderness rather than increasing development in wilderness by installing food storage boxes using helicopters.*	-0.44 (1.02)	-0.30 (1.10)

Install toilets and transport human waste with helicopters rather than requiring visitors to dig cat holes or pack waste out.	0.24 (1.24)	0.57 (1.21)
Require visitors to dig cat holes or pack waste out rather than increasing development in wilderness by providing pit toilets.*	-0.22 (1.14)	0.12 (1.10)
<i>Cronbach's Alpha (α)</i>	<i>0.64</i>	<i>0.75</i>

*These items are reverse-coded.

Scale: -2 = strongly oppose, -1 = oppose, 0 = neutral, 1 = support, 2 = strongly support.

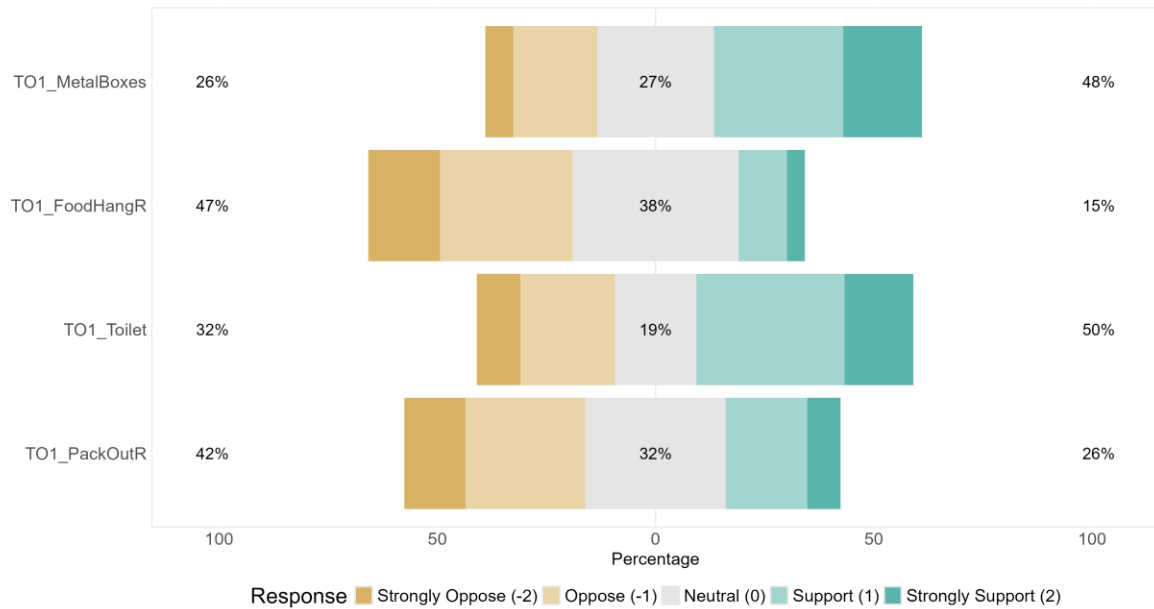


Figure 4a. Distribution of day users' support for wilderness management actions that balance the confinement of recreational experiences and the installation of permanent developments in the SMW.

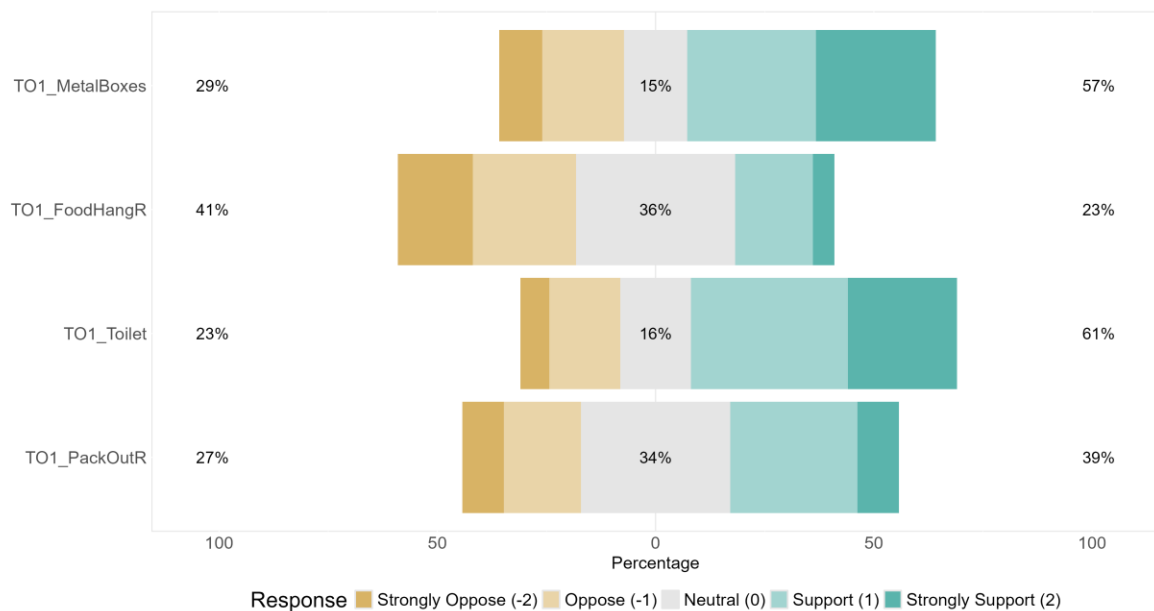


Figure 4b. Distribution of overnight users' support for wilderness management actions that balance the confinement of recreational experiences and the installation of permanent developments in the SMW.

The second scenario presented to visitors measured their preferences for management actions that balance the provision of access to primitive recreational opportunities and the undeveloped character of SMW:

Scenario 2: SMW managers face choices between permanent developments (e.g., fixed bolts, more extensive trail systems), management actions that are prohibited but allowed if deemed necessary (helicopter landings, motorized tools), and providing recreation opportunities where visitors are self-reliant, experience primitive conditions, and foster respectful relationships with the environment.

Cronbach's alpha coefficients for the primitive recreation access – undevelopment scale were 0.43 and 0.47 for day and overnight users, respectively (Table 25). These coefficients fall below the threshold for acceptable internal consistency (Vaske, 2019), which suggests that these indicators may not reliably measure a unified construct for these management trade-offs (Vaske, 2019). Thus, the indicators should generally be interpreted individually. On average, day and overnight users were less concerned about the undeveloped quality than their concern for access to primitive recreation opportunities more broadly. Specifically, day users on average were most supportive of providing additional signage to help make navigation in the wilderness easier and safer ($M = 0.86$, $SD = 0.84$), while overnight users were least supportive of discontinuing the maintenance of some trails to limit the number of trails in the wilderness on average ($M = 0.68$, $SD = 0.93$). These results suggest that on average, visitors prioritize having greater access to primitive recreation as opposed to management focused on the undeveloped quality of wilderness. Figures 5a and 5b depict the distribution of support across all management actions for day and overnight users, respectively.

Table 25. Descriptive statistics of SMW users' support for trade-off 2 management actions and reliability of indicators.

	Day user	Overnight user
Trade-off 2 Indicators	Mean (Std. Deviation)	Mean (Std. Deviation)
Prohibit fixed bolts for climbing anchors in wilderness to limit development.*	-0.03 (1.09)	0.03 (1.07)
Provide additional signage (directional signs, trail markers) to make navigation in wilderness easier and safer.	0.86 (0.84)	0.43 (1.02)
Maintain and clear lots of existing trails using helicopters and motorized tools (chainsaws, rock drills) to support access to challenging to reach places.	0.06 (1.16)	0.06 (1.16)
Discontinue maintenance of some trails to limit the number of trails in wilderness.*	0.59 (1.02)	0.68 (0.93)
<i>Cronbach's Alpha (α)</i>	<i>0.43</i>	<i>0.47</i>

*These items are reverse-coded.

Scale: -2 = strongly oppose, -1 = oppose, 0 = neutral, 1 = support, 2 = strongly support.

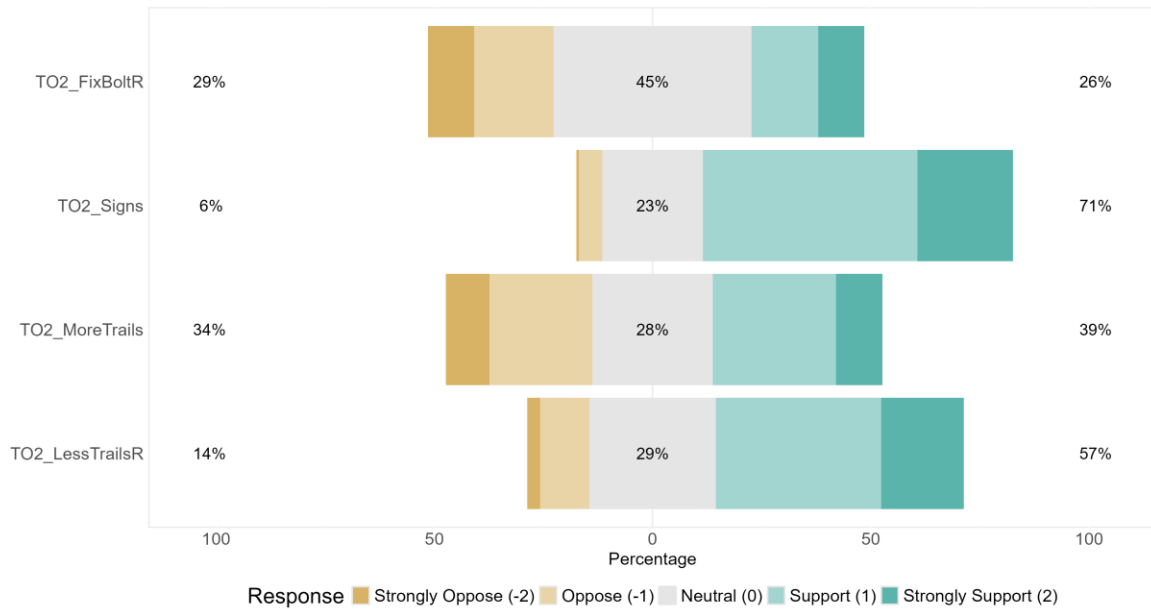


Figure 5a. Distribution of day users' support for wilderness management actions that balance the provision of primitive recreational opportunities and permanent installations in the SMW.

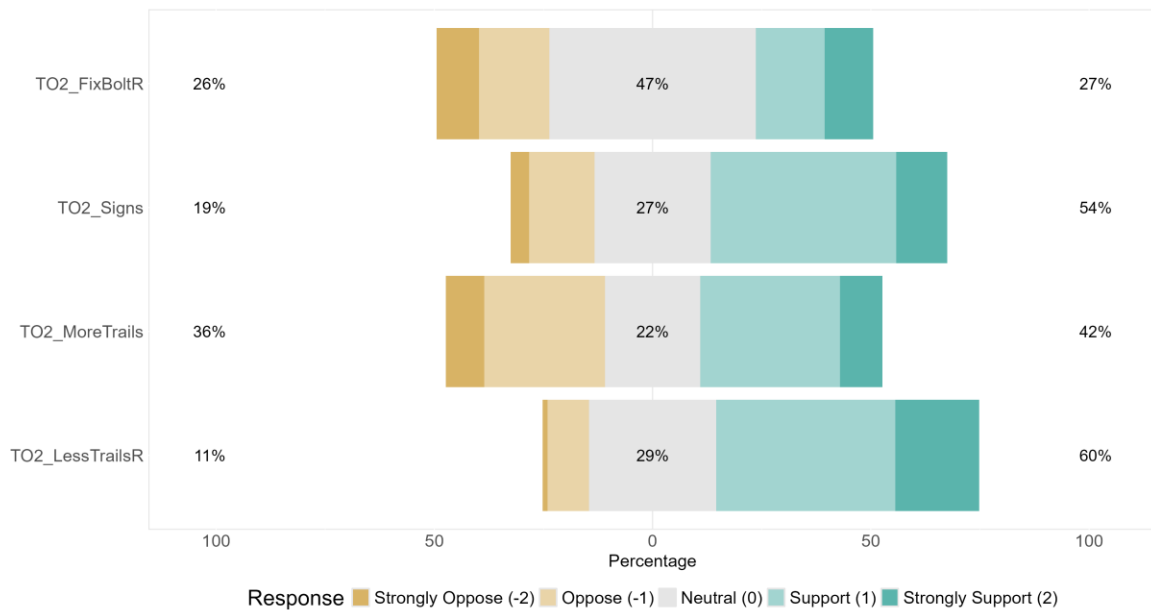


Figure 5b. Distribution of overnight users' support for wilderness management actions that balance the provision of primitive recreational opportunities and permanent installations in the SMW.

The third and final scenario asked visitors to rate their support of management actions that focused on untrammelled nature compared to management actions that prioritized the maintenance of natural conditions:

Scenario 3: SMW managers face choices between preserving natural conditions (e.g., a landscape with old growth trees, landscapes without non-native plants and animals), and maintaining free-willed ecosystems with minimal human intervention (e.g., limited restorative plantings, without chemical treatments, unsuppressed wildfire).

Table 26 presents the descriptive statistics and Cronbach's alpha coefficients related to scenario 3. Cronbach alpha coefficients for day (0.48) and overnight users (0.56) were both below the acceptable threshold for internal reliability (Vaske, 2019). Both day ($M = 0.98$, $SD = 0.86$) and overnight visitors ($M = 0.93$, $SD = 0.80$) were most supportive of using management-ignited fire to reduce future high-intensity fire. The least supported management action presented in this scenario by both day ($M = -0.25$, $SD = 0.98$) and overnight users ($M = -0.13$, $SD = 0.89$) was to intervene in the ecosystem rather than allowing it transform with a changing climate on its own. Generally, day and overnight visitors shared higher priority concerns for actively maintaining natural wilderness conditions rather than managing for the untrammelled character of wilderness, on average. The distribution of support levels regarding each management action is displayed in figures 6a and 6b for day and overnight users, respectively.

Table 26. Descriptive statistics of SMW users' support for trade-off 3 management actions and reliability of indicators.

	Day user	Overnight user
Trade-off 3 Indicators	Mean (Std. Deviation)	Mean (Std. Deviation)
Re-locate threatened and endangered species to help species adapt to climate change.	0.64 (1.00)	0.42 (1.02)
Spray (to kill) or remove non-native plants and trees.	0.49 (0.97)	0.39 (0.99)
Suppress wildfire to protect old growth forests.	0.61 (1.08)	0.47 (1.05)
Avoid intervening in the ecosystem to let it transform with a changing climate on its own.*	-0.25 (0.98)	-0.13 (0.89)
Use management-ignited fire to reduce future high-intensity fires.	0.98 (0.86)	0.93 (0.80)
<i>Cronbach's Alpha (α)</i>	<i>0.48</i>	<i>0.56</i>

*These items are reverse-coded.

Scale: -2 = strongly oppose, -1 = oppose, 0 = neutral, 1 = support, 2 = strongly support.

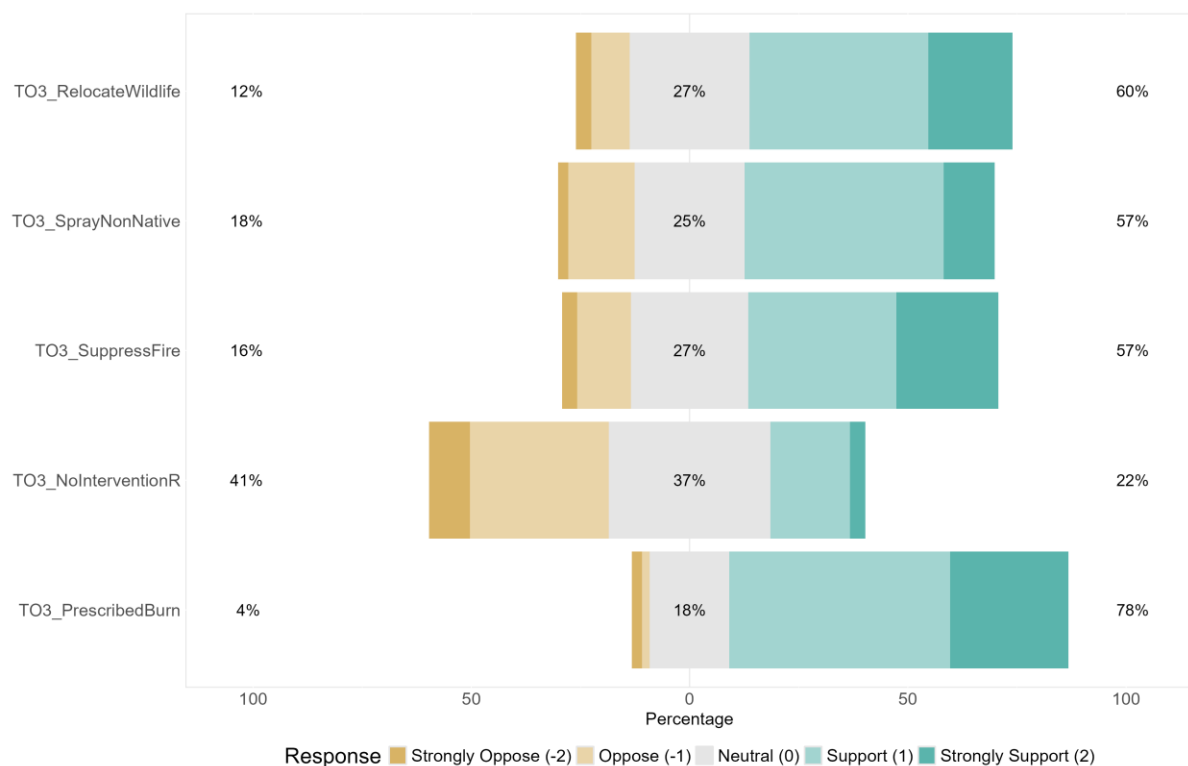


Figure 6a. Distribution of day users' support for wilderness management actions that focus on untrammeled nature compared to management actions that prioritize natural conditions in the SMW.

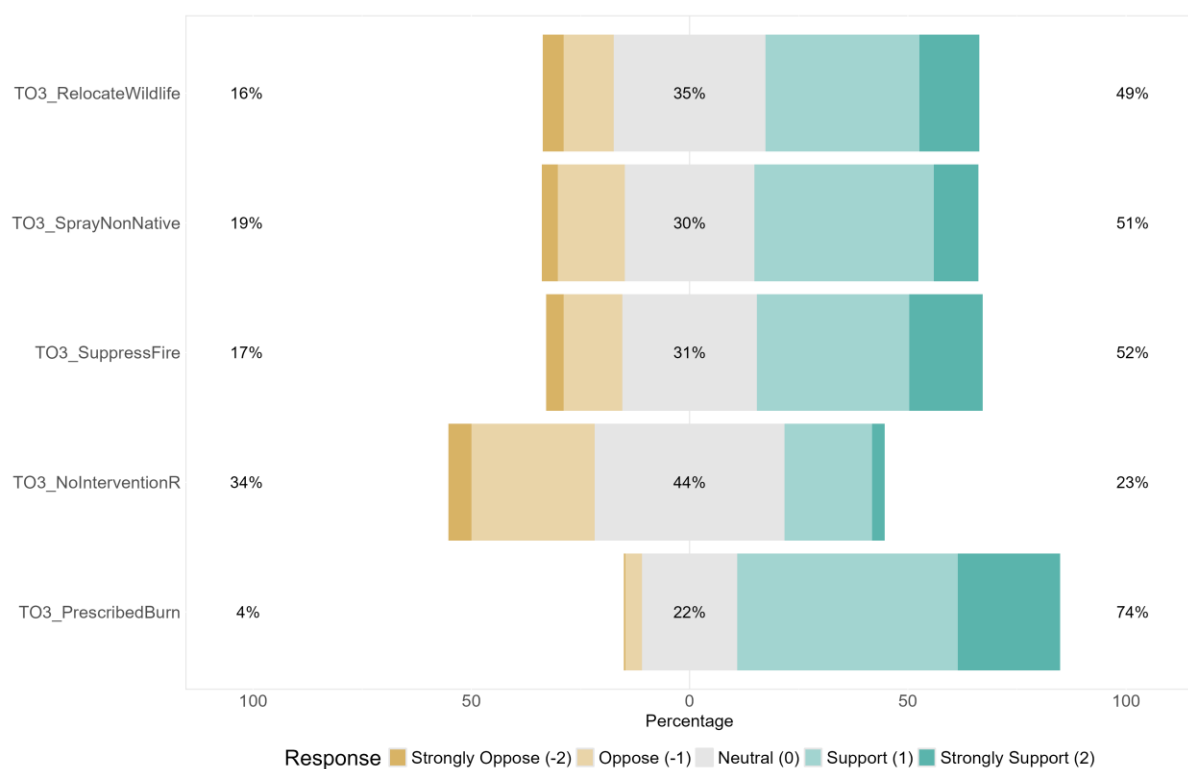


Figure 6b. Distribution of overnight users' support for wilderness management actions that focus on untrammelled nature compared to management actions that prioritize natural conditions in the SMW.

To understand typologies of wilderness campers—per their perspectives on these wilderness character trade-offs—a combined hierarchical and k-means clustering approach was undertaken with the data stemming from the three scenarios. This yielded three clusters of visitors with the following wilderness value typologies (Figure 7):

Cluster 1: Untrammeled-centric visitors ($n = 173$). Compared to the overall average across all respondents, visitors prioritize maintaining natural conditions through reducing human impacts compared to maintaining unconfined and undeveloped qualities, less concerned about undeveloped quality compared to primitive recreation opportunities, and prioritized untrammeled conditions to compared to maintaining natural conditions.

Cluster 2: Wilderness gardeners ($n = 177$). Compared to the overall average across all respondents, these visitors prioritize maintaining natural conditions through reducing human impacts compared to maintaining unconfined and undeveloped qualities, less concerned about undeveloped quality compared to primitive recreation opportunities, and prioritize natural conditions over untrammeled nature.

Cluster 3: Undeveloped-centric visitors ($n = 195$). Compared to the overall average across all respondents, these visitors prioritize maintaining unconfined and undeveloped qualities compared to maintaining natural conditions through reducing human impacts, more concerned about the undeveloped quality compared to primitive recreation opportunities, and remained neutral on trammeling versus natural conditions

Following cluster analysis, wilderness camping permit data was explored for all clusters, revealing that Undeveloped-centric visitors were significantly more likely to camp in cross country zones than semi-developed wilderness campsites, compared to both other clusters ($p = 0.012$; Table 27).

Table 27. Wilderness camping locations among clusters.

	Camping Locations		Total
	Campsites	Cross Country Zones	
Undeveloped-centric visitors	137 (70.3%)	58 (29.7%)	195
Untrammeled-centric visitors	138 (79.8%)	35(20.2%)	173
Wilderness gardeners	146 (82.5%)	31 (17.5%)	177
Total	421 (77.2%)	124 (22.8%)	545

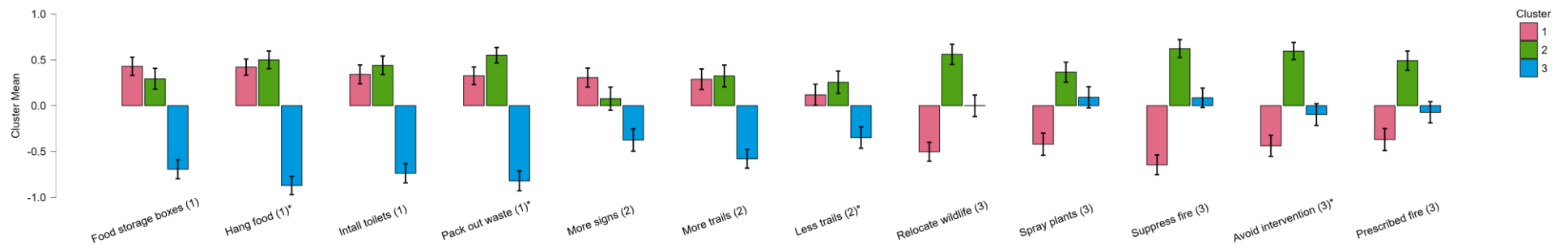


Figure 7. Mean difference between clusters for wilderness character trade off items included in the three scenarios.

If a visitor indicated within their survey that they had participated in mountaineering/alpine climbing during their trip to SMW, they were asked to answer an additional question regarding their perspectives on climbing related management actions. Table 28 provides descriptive statistics of day and overnight climbers' support for each management action. Cronbach's alphas for day (0.66) and overnight visitors (0.79) indicate internal reliability of each climbing management indicator. On average, both day ($M = -0.44$, $SD = 1.42$) and overnight visitors ($M = -1.22$, $SD = 0.92$) were least supportive of removing the existing fixed anchors and disallowing the placement of future anchors in the SMW. The most supported action from day ($M = 1.11$, $SD = 0.78$) and overnight users ($M = 0.37$, $SD = 1.01$) was increasing patrols of climbing rangers to check permits and access resource and climbing conditions on average. The distribution of day users' (Figure 8a) and overnight users' (Figure 8b) responses toward each proposed management action is displayed in the Likert plots below.

Table 28. Descriptive statistics of SMW mountaineer/alpine climbers' support for climbing related management actions and reliability of indicators.

	Day climbers	Overnight climbers
Climbing Management Indicators	Mean (Std. Deviation)	Mean (Std. Deviation)
Disallowing future installation of fixed anchors, but leaving existing fixed anchors	0.11 (1.17)	-0.44 (1.26)
Removing existing fixed anchors, and disallowing the placement of future fixed anchors	-0.44 (1.42)	-1.22 (0.92)
Authorizing existing and future fixed anchors*	-0.33 (1.00)	-0.73 (1.09)
Increasing patrols of climbing rangers to check permits and assess resource and climbing conditions	1.11 (0.78)	0.37 (1.01)
Implementing required permits for individual climbing routes to limit the number of climbers on a route at one time to improve safety and opportunities for solitude	0.33 (0.87)	-0.27 (1.11)
<i>Cronbach's Alpha (α)</i>	0.66	0.79

*These items are reverse-coded.

Scale: -2 = strongly oppose, -1 = oppose, 0 = neutral, 1 = support, 2 = strongly support.

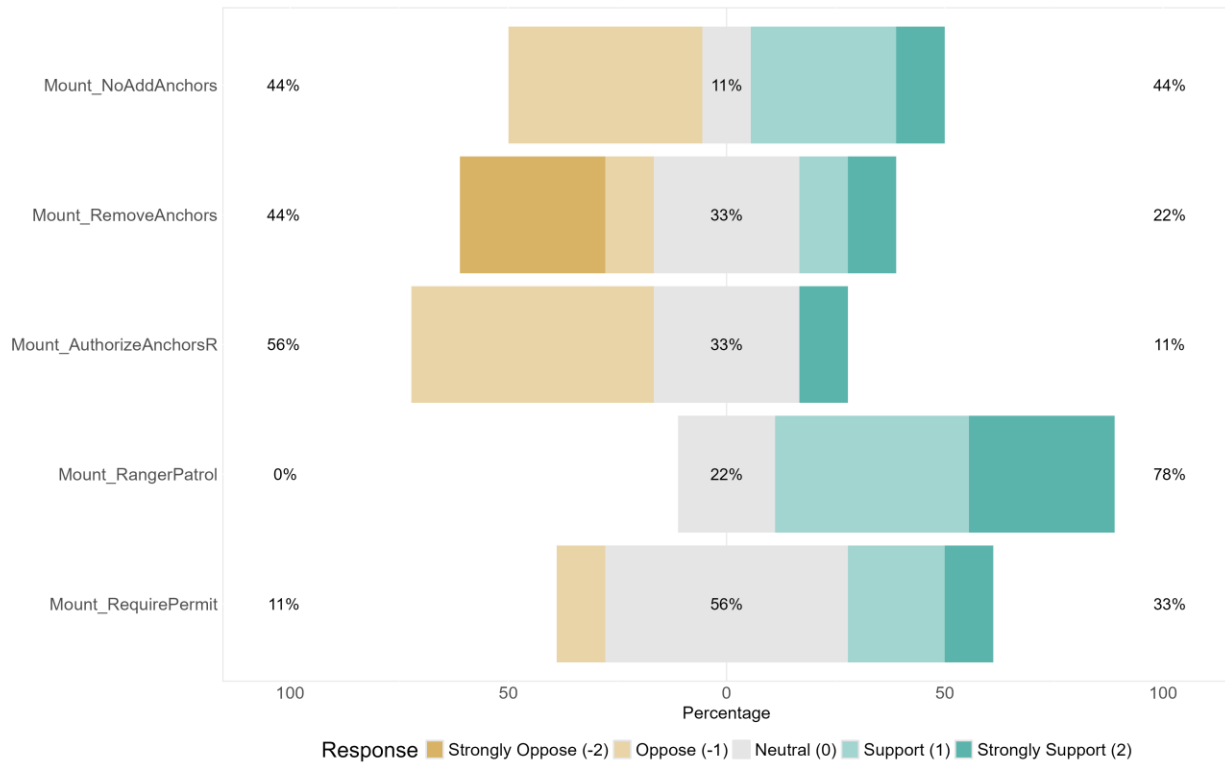


Figure 8a. Distribution of day users' support for climbing related management actions in the SMW.

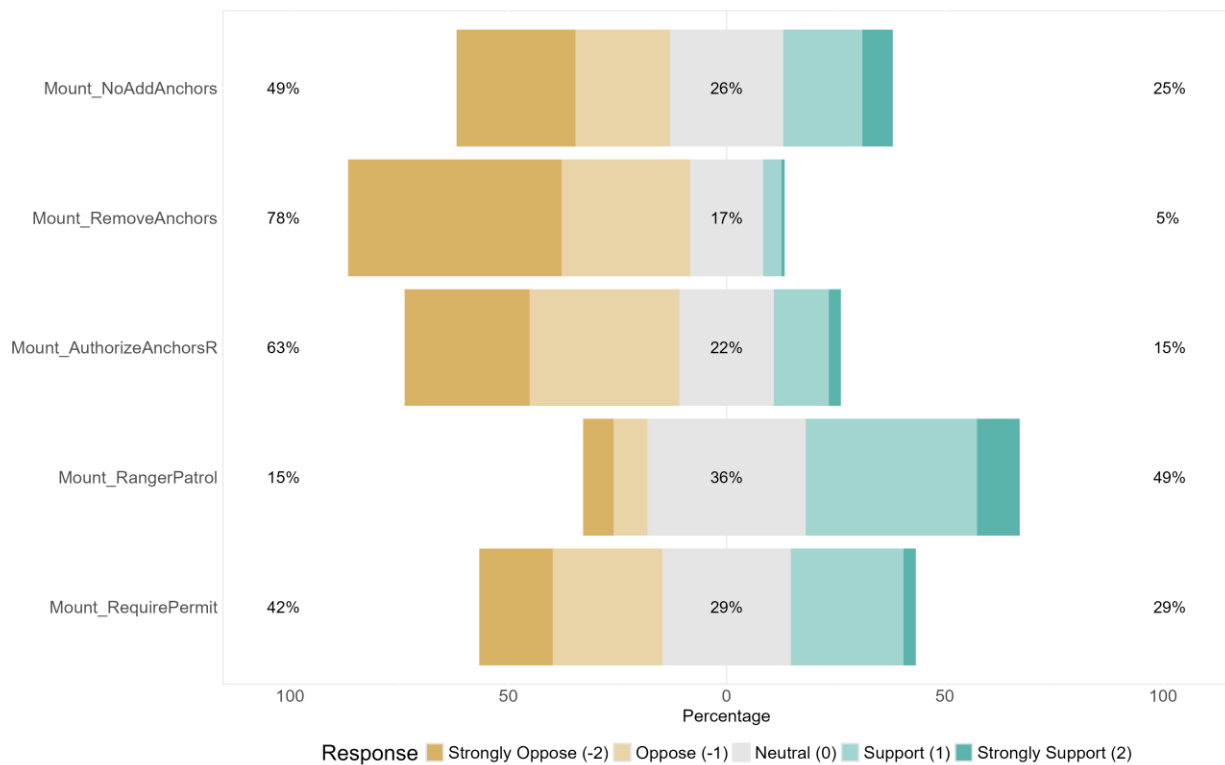


Figure 8b. Distribution of overnight users' support for climbing related management actions in the SMW.

Visitors were also given an opportunity at the end of the survey to provide any recommendations for planning or managing the SMW. This open-ended question resulted in 279 responses from both day and overnight users, and their responses highlighted several key themes for planning and management:

- **Access:** A commonly reported overall concern was balancing access with resource preservation. Many respondents emphasized the need to improve park access by maintaining roads and reopening trails and campgrounds. Other suggestions included increasing development in some of the more popular areas to reduce human impact on park and wilderness resources such as adding more parking areas or installing toilets and bear boxes in the backcountry.
- **Backcountry Permits:** Respondents commonly expressed their concern regarding the backcountry permitting process. Some offered suggestions for streamlining the permit process to ensure fair and regulated usage of the wilderness areas. Suggested examples included adding priority access for locals, increasing first-come, first-served permits, and incorporating penalties for those who do not show up for their reservations. Others made note of the difficulty of accessing the WIC to pick up permits (e.g., traveling further or having to backtrack to get there, needing to pick up permits prior to 11am, inconvenient office hours).
- **Wildness and Preservation:** A significant portion of responses stressed the importance of keeping the wilderness "wild." Recommendations included minimizing human impact, avoiding overdevelopment, and focusing on preserving the natural state to deter littering and protect the ecosystem. Responses highlighted the importance of maintaining the rawness and ruggedness of NOCA and the SMW.
- **Safety and Regulation Enforcement:** Safety concerns regarding wildlife and climbing access were expressed by some respondents. Suggestions included installing bear boxes or bear wires for bear safety and allowing fixed anchors and bolts to be installed for safer climbing. Others suggested increasing law enforcement for park and wilderness regulations such as parking at trailheads, properly obtaining and displaying permits, and following Leave-no-Trace principles in the wilderness.
- **Education and Awareness:** A smaller subset of feedback discussed the importance of educating visitors about responsible wilderness usage, environmental impacts, and safety. Some recommendations included providing better signage and more opportunities (e.g., ranger-led programs) to provide information about Leave-no-Trace principles, wilderness and trail etiquette, and bear awareness and safety, especially in regard to the reintroduction of grizzly bears into the NOCA Complex.

Management Implications

The results of this study highlight several key management implications for Stephen Mather Wilderness stewardship regarding general visitor use and visitors' wilderness experience preferences.

Supporting visitor motivations and maintaining high quality experiences

Visitors agreed that the SMW is the best place for their preferred activities, including on-trail hiking, overnight backpacking, mountaineering, off-trail hiking, and night sky and wildlife viewing. Additionally, visitors supported the idea that North Cascades National Park should remain the least developed and most challenging to access compared to other national parks in the Pacific Northwest. These results support the uniqueness of both the SMW and larger NOCA Complex, which reinforces the value of management strategies that preserve these distinctive qualities.

Among all visitors, the strongest motivators for visiting the SMW were the desire to connect with nature and seek solitude. Day visitors, however, reported greater motivations for connecting with nature than overnight visitors, who were more motivated by the ability to challenge themselves and seek out unconfined recreation in the wilderness. To support opportunities for solitude, SMW managers may consider marketing materials that encourage use of lesser-visited areas in the wilderness, which may disperse concentrated use in more popular areas. The NPS website could also include additional information with trail and wilderness destination descriptions that are curated for the various motivations of different visitors. For example, descriptions of trails for “those seeking adventure” or “those looking to connect deeper with nature” could be incorporated into the “Day Hiking” and “Wilderness Trip Planner” webpages to help visitors select routes that align with their motivations.

In general, survey respondents did not indicate that wilderness experiences were negatively impacted by a variety of issues. For instance, the presence of scientific or research equipment was not a concern to the vast majority of visitors. Only toilet paper and human waste along with motorized noise appear to be a potential concern, although more than 80% of all visitors indicated that these are not current issues that were experienced during the time of data collection. On average, visitors stated that hearing and seeing visitors on the trail and/or while camping had minimal to no negative impact on their opportunities for solitude. Further, all visitors indicated that having a visitor capacity for overnight camping had a relatively small, slightly positive impact on their solitude experience, with overnight users rating the visitor capacity significantly higher than day users. Overall, the survey highlights visitors' support for wilderness management and the high-quality opportunities for solitude in SMW.

Prioritizing wilderness character

This study set out to measure visitors' preferences for various wilderness management actions that, at times, create trade-offs between competing qualities of wilderness characteristics. To understand which wilderness characteristics that SMW visitors prioritize, participants were presented with three different scenarios that compared management actions that enhance (or diminish) certain characteristics.

In the first scenario, we were initially hoping to evaluate visitor preferences regarding wilderness management actions that prioritize unconfined recreational experiences compared to undeveloped wilderness, considering increased human impacts on natural conditions. Our results suggest that people are more likely to support an overall emphasis on management that reduces human impacts rather than management that prioritizes unconfined and undeveloped qualities of wilderness. Managers might consider this perspective when contemplating creating regulations and developments that are intended to reduce human impacts in the SMW. If interested in creating new regulations or developments, there is an opportunity for SMW managers to highlight how these actions will reduce human impacts on the natural environment.

The second scenario examined visitors' preferences for management actions that prioritize the undeveloped quality of wilderness compared to an increase in primitive recreation access. On average, visitors supported the prioritization of primitive recreation access as opposed to the undeveloped quality of wilderness. If managers are contemplating adding new trails or signage in the SMW, this action may be supported by visitors, on average, because these actions would increase visitor access to primitive recreation opportunities. SMW managers may also consider communicating with visitors the importance of the undeveloped characteristic of wilderness and why development may be limited in these areas.

Finally, visitors also indicated, on average, that they are more supportive of management actions that help preserve natural conditions compared to management that prioritizes the untrammeled character of wilderness. This suggests that visitors place less emphasis on untrammeled wilderness; therefore, there may be value in explaining the importance of the untrammeled characteristic and what it hopes to achieve. Managers may also want to take visitors' lack of priority for untrammeled character into consideration when making decisions about intervening in the SMW to maintain natural conditions in the face of climate change.

Wilderness visitor typologies

Cluster analysis of overnight wilderness visitors (campers) based on their preferences concerning wilderness management trade-offs, revealed three clusters: Undeveloped-centric visitors, Untrammeled-centric visitors, and Wilderness gardeners. Each of these clusters represents approximately one third of the wilderness camper base in the SMW. These results confirm that there is no "average visitor" to the SMW. Instead, SMW visitors have varying views on how the wilderness should be managed (or left untrammeled). Installing food storage boxes in the wilderness may be met with support from the Untrammeled-centric visitors and Wilderness gardeners, but it would be met with opposition from the Undeveloped-centric visitors. Conversely, suppressing fire in the wilderness would be supported by the Wilderness gardeners but opposed by the Untrammeled-centric visitors. The wilderness visitor typologies highlight that most management decisions will be viewed differently by different portions of the visiting population (see Figure 7); therefore, there is value in clearly communicating with SMW visitors around the reasoning and goals of potential management actions.

Communicating with SMW visitors

Most visitors (67.4% day and 78.7% overnight) got their trip planning information through the NPS website. These results suggest it is important to have the most effective, accurate, and up-to-date information on this website prior to investing resources in other communication channels. Other important information sources for visitors included outside organizations like the Washington Trails Association (WTA). Perhaps SMW managers could work with WTA staff to ensure that information included on their websites reflects the key information found on the NPS website.

Some visitors also left open-ended comments regarding the importance of educating visitors on wildlife and climbing safety as well as Leave No Trace principles, so staff may consider verifying that this type of information is easily found on the NPS website and/or creating educational programming focused on these topics.

Creating wilderness awareness

A large portion of both day and overnight wilderness visitors were unaware that they were recreating within a federally designated Wilderness area (61.6% and 44.9%, respectively). This suggests that many SMW visitors may be less aware of where the wilderness boundaries are, or they might have limited knowledge about the wilderness area in general. This presents an opportunity for SMW wilderness stewardship planners to consider additional communication and education strategies through mediums such as the NPS website, social media, and, namely, signage.

Considering alternative transportation

Overall, most visitors reported being unlikely to use a shuttle service to visit major destinations in the North Cascades National Park Service Complex due to the inconvenience and the potential to cause crowding in certain areas. Based on these results, there is reason for SMW planners to carefully weigh the costs and benefits of investing resources into a transit service at this time.

Utilizing WIC for overnight permits

Most overnight visitors stopped by the Wilderness Information Center (WIC) to pick up their overnight permits, although a small percentage (15.4%) did not. In 2024, NOCA piloted the Good Stewards Program that was designed to allow frequent overnight users to print their permit from home without having to visit the WIC prior to their trip. This could potentially explain why some people did not need to pick up their overnight permit at the WIC. Alternatively, some visitors expressed concerns in open-ended comments at the end of the survey about the inconvenience of traveling to the WIC prior to their trip due to its location on the opposite side of the park complex or the WIC not opening early enough to get an early start to their recreation objectives. In these situations, NOCA may consider opportunities to expand the Good Stewards Program to additional visitors like those who will be traveling from and recreating on the east side of the park complex if they communicate with park staff ahead of time. SMW wilderness stewardship planners may also consider working with other agency contact stations throughout the NOCA Complex and U.S. Forest Service contact stations (e.g., Methow Valley Ranger District) to distribute overnight permits in that area and communicate clearly with visitors the location of the nearest station to pick permits up.



Day hikers following trail through snow up to Hidden Lake Lookout. Michael Shroyer

Rationing overnight wilderness permits

In 2024, during “peak season” use—between May and October, when data was collected for this study—SMW and NOCA backcountry permits were distributed through three different rationing methods: 1) an Early-Access Lottery, 2) a General On-Sale reservation period, and 3) walk-up permits. Approximately 40% of permits were held for walk-up permits that could be picked up in person at the WIC and other permitting offices the day of or the day before the trip started. The other 60% of backcountry permits were rationed through an Early-Access Lottery system, where lottery winners could make reservations for their wilderness trip anywhere from one to seven months in advance. The lottery period was followed by a General On-Sale period where any remaining reservable sites were released on a singular day, where visitors could make reservations anywhere from three weeks up to six months in advance (National Park Service, 2023).

The results of this study suggest that SMW visitors are generally supportive of all possible rationing methods for backcountry campsites except for increasing the cost. The most supported rationing method across all visitors in this sample, on average, was a system that used a combination of rationing techniques, similar to the current system already in place for distributing backcountry camping permits. On average, visitors reported feeling neutral about using an online lottery system, although day users slightly opposed while overnight users slightly supported the lottery.

On average, visitors also reported supporting a system where advanced reservations are released through a combination of timeframes. This study collected information on visitors' preferred and maximum booking windows which can aid SMW planners in creating a future plan that considers releasing backcountry camping permits in multiple reservation windows following (or in place of) the initial Early Access Lottery period. Included below are three potential recommendations for a system that integrates a Recreation Rationing Spectrum (Rice & Phillips, 2023) where permits are released through multiple booking windows:

1. Permits released in **one** advanced reservation window based on the median preferred booking window: 1 month.
2. Permits released in **two** advanced reservation windows based on distribution of preferred booking windows split equally into thirds: 1 week and 2 months.
3. Permits released in **three** advanced reservation windows based on quartiles preferred booking windows: 1 week, 1 month, and 3 months.

If the park cannot accommodate shorter booking windows due to various management constraints, managers may consider using the median results from the visitors' maximum booking window as the standard time to release permits (3 months in advance).

Supporting organized groups

Only 4% of SMW visitors (30 out of 751 total respondents) reported recreating with an organized group. This suggests an opportunity for SMW planners and managers to engage with organizations—such as outdoor clubs, affinity groups, and commercial guides—that may facilitate increased access to wilderness experiences. Survey results indicate that visitors slightly agreed, on average, that commercial guides can provide accessible wilderness opportunities and help promote appropriate wilderness behaviors. Additionally, visitors reported feeling relatively neutral, on average, with there being too many commercial guides in the SMW. While management might prioritize managing for vast majority of visitors who travel to SMW on their own, these results suggest that there may be room to expand opportunities for commercial guides and other organized groups to coordinate SMW trips with other visitors in the future.

The number of visitors recreating with organized groups may be slightly skewed, however, as only permit holders were distributed the survey via the email that was used to secure the permit through Recreation.gov. This suggests there might be additional SMW visitors who recreated with an organized group that were not recorded in this study. Contacting only the trip leader could also lead to potential trip leader bias in these results of the study. This suggests that these results may favor more interested, committed wilderness visitors, who may have different opinions from the other participants in their group (Lucas & Oltman, 1971).

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Appendix A: Visitor Survey

PAPERWORK REDUCTION and PRIVACY ACT STATEMENT: The Paperwork Reduction Act requires us to tell you why we are collecting this information, how we will use it, and whether or not you have to respond. We are authorized by the National Park Service Protection Interpretation and research in System (54 USC §100702) to collect this information. The routine uses of this information will be for the benefit of NPS Managers and Planning staff in North Cascades National Park in future initiatives related to the visitor use and resource management within the site. The data collected will be summarized to evaluate visitor uses and expectations during their visit at North Cascades National Park. Your responses to this collection are completely voluntary and will remain anonymous. You can end the process at any time and will not be penalized in any way for choosing to do so. All contact information collected for the purpose of the follow-up survey will be destroyed at the end of the collection period and no personal identifiable records will be maintained or stored for any purposes. Data collected will only be reported in aggregates and no individually identifiable responses will be reported. A Federal agency may not conduct or sponsor, and you are not required to respond to, a collection of information unless it displays a currently valid OMB Control Number (1024-0224). We estimate that it will take about 15 minutes to complete this on-site questionnaire. You may send comments concerning the burden estimates or any aspect of this information collection to: Dr. Will Rice, University of Montana, william.rice@umontana.edu (email); or David Pettebone, National Park Service, david_pettebone@nps.gov (email).

Intercept opening script

First, determine if visitor is eligible:

Hi, my name is _____. The University of Montana is cooperating with the US Forest Service in conducting a visitor survey on the Stephen T. Mather Wilderness. The visitor use survey will support wilderness stewardship planning, including a future management plan. The questionnaire will take about 20 minutes to complete.

Only those 18 or older are eligible. Your participation is voluntary, you may discontinue the survey at any time, and there are no risks associated with participating in this survey. Your survey answers will be kept confidential. Your input is very important. Would you be willing to complete a survey?

➔ If the visitor says **YES**, read the following script:

Before we begin, I would like to let you know that this survey has been approved by the Office of Management and Budget. It is important to note that a Federal agency may not conduct or sponsor, and you are not required to respond to, a collection of information unless it has a valid OMB control number. The control number for this collection is 1024-0224 and this number is valid through 9/30/2024. Secondly, your participation is voluntary and your name will never be connected with your individual responses. This survey will only take about six minutes of your time today.

➔ If the visitor says **NO**, read the following script:

Ok, may I ask two quick questions?

➔ If the visitor says **NO**, thank them for their time.

➔ If the visitor says **YES**, ask the non-response bias questions: See questions 2 and 6 below.

1. Before taking this survey, were you aware that you were recreating within the boundaries of the federally designated Stephen T. Mather Wilderness area during this trip?

☐ YES

☐ NO

2. In which year did you make your first visit to Stephen T. Mather Wilderness? (*insert year below*)

3. What seasons do you visit in throughout the year? (*select all the apply*)

☐ Fall (September – November)

☐ Winter (December – March)

☐ Spring (April – May)

☐ Summer (June – August)

- 4a. Did you spend at least one night in the backcountry of Stephen T. Mather Wilderness (i.e., backcountry camping, backpacking) on this trip?

☐ YES: How many nights did you spend in the Stephen T. Mather Wilderness on this trip?

☐ NO: How many hours did you spend in the Stephen T. Mather Wilderness on this trip?

5. (*if 4a = YES*) Did you stop into the wilderness information center (WIC) to pick up your overnight permit?

☐ YES

☐ NO

6. How many people were in your group, including you? (*choose number below*)

0 5 10 15 20 25 30

Number in Group ()



7. Do any of the following describe your group you are traveling with?

☐ *Not with an organized group*

☐ Commercially guided group

☐ Research group

☐ Club/organization/school (specify) _____

☐ Other (specify) _____

8. Prior to your arrival, what sources of information did you and your group use to plan your trip?
(select all that apply)

- ☐ Park website (nps.gov)
 - ☐ NPS social media accounts
 - ☐ Recreation.gov
 - ☐ Other websites/social media/apps (specify) _____
 - ☐ Commercial guide/concessionaire
 - ☐ Other (specify) _____
-

9a. Below is a list of activities available in the Stephen T. Mather Wilderness. Please indicate which of these activities you have participated in during this visit. *Check all that apply.*

- ☐ Backpacking
- ☐ Mountaineering/Alpine Climbing
- ☐ Stock Packing
- ☐ Horseback riding
- ☐ Trail running
- ☐ Paddling/Kayaking/Canoeing/Pack rafting
- ☐ Recreational Fishing
- ☐ On-trail Hiking
- ☐ Off-trail Hiking
- ☐ Photography/Videography
- ☐ Night Sky Viewing
- ☐ Guided Hike or Climb
- ☐ Wildlife Viewing
- ☐ Other (specify) _____

9b. Below is a list of activities available in the Stephen T. Mather Wilderness. Please indicate which one of these activities was **your primary activity** during this visit.

- ☐ Backpacking
- ☐ Mountaineering/Alpine Climbing
- ☐ Stock Packing
- ☐ Horseback riding
- ☐ Trail running
- ☐ Paddling/Kayaking/Canoeing/Pack rafting
- ☐ Recreational Fishing
- ☐ On-trail Hiking
- ☐ Off-trail Hiking
- ☐ Photography/Videography
- ☐ Night Sky Viewing
- ☐ Guided Hike or Climb
- ☐ Wildlife Viewing
- ☐ Other (specify) _____

10. Which of the following statements best defines your relationship to your primary activity?

(please select only one choice)

- ☐ New recreationist - "This is the first time I participated in this activity in a setting like this. I do not know a lot about this activity. I am participating to spend time with my friends/family or to have a new experience. I do not travel to destinations specifically to participate in this activity."
- ☐ Passionate new recreationist - "This is one of the first times I participated in this activity in a setting like this, but I had already some knowledge about it. Participating in this activity would be one reason to come back to this area or travel to a similar area in the future."
- ☐ Active recreationist - "I have participated in this activity before. This is an outdoor activity that I appreciate a lot. I have considerable knowledge about this activity and participating in this activity would be one reason to come back to this area or travel to a similar area in the future."
- ☐ Committed recreationist - "I have participated in this activity many times before and I love to do it. I came to this area to participate in this activity and go to similar destinations for the same reason. I have extensive knowledge about how to participate in this activity and associated rules and regulations."

11. (If Mountaineering/Alpine Climbing was selected in 9a) If you participate in mountaineering or alpine climbing, please provide your level of support for each climbing related management action that may be explored in a future planning process and subject to NPS policy and regulations:

	Strongly Oppose	Oppose	Neutral	Support	Strongly Support
Disallowing future installation of fixed anchors, but leaving existing fixed anchors	-2	-1	0	1	2
Removing existing fixed anchors, and disallowing the placement of future fixed anchors	-2	-1	0	1	2
Authorizing existing and future fixed anchors	-2	-1	0	1	2
Increasing patrols of climbing rangers to check permits and assess resource and climbing conditions	-2	-1	0	1	2
Implementing required permits for individual climbing routes to limit the number of climbers on a route at one time to improve safety and opportunities for solitude	-2	-1	0	1	2

12. How much of a problem were the following conditions during your experience in the Stephen T. Mather Wilderness? *(select one answer for each statement)*

	Not a problem at all	Slight problem	Moderate problem	Serious problem	Did not observe
Toilet paper and human waste	1	2	3	4	X
Presence of scientific monitoring stations, wildlife cameras, radio towers, other installations and developments	1	2	3	4	X
Noise from motorized use such as chainsaws and helicopters	1	2	3	4	X

13. How much did the following conditions add to (or detract from) your opportunities for solitude in the Stephen T. Mather Wilderness? *(select one answer for each statement)*

	Strongly detracted	Slightly detracted	Had no impact	Slightly added	Strongly added	Did not experience the condition
Hearing and seeing visitors on the trail	-2	-1	0	1	2	X
Hearing and seeing visitors while camping	-2	-1	0	1	2	X
Having a visitor capacity (limited permits) for designated campsites and cross-country zones	-2	-1	0	1	2	X

14. Wilderness stewardship requires navigating trade-offs between maximizing often-competing qualities of wilderness character. Improving one quality may negatively impact other qualities. **With that in mind, please rate your support for the following management actions.**

Tradeoff 1: Stephen T. Mather Wilderness (SMW) managers face a choice between transporting permanent developments and installations using helicopters (both generally prohibited in wilderness but allowed if deemed necessary) and increased human impacts to natural conditions.

	Strongly Oppose	Oppose	Neutral	Support	Strongly Support
Install metal wildlife-resistant food storage boxes using helicopters rather than requiring campers to hang food or carry bear cans.	-2	-1	0	1	2

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	-1	0	1	2
Install toilets and transport human waste with helicopters rather than requiring visitors to dig cat holes or pack waste out.	-2	-1	0	1	2
Require visitors to dig cat holes or pack waste out rather than increasing development in wilderness by providing pit toilets.	-2	-1	0	1	2

Tradeoff 2: SMW managers face choices between permanent developments (e.g., fixed bolts, more extensive trail systems), management actions that are prohibited but allowed if deemed necessary (helicopter landings, motorized tools), and providing recreation opportunities where visitors are self-reliant, experience primitive conditions, and foster respectful relationships with the environment.

	Strongly Oppose	Oppose	Neutral	Support	Strongly Support
Prohibit fixed bolts for climbing anchors in wilderness to limit development.	-2	-1	0	1	2
Provide additional signage (directional signs, trail markers) to make navigation in wilderness easier and safer.	-2	-1	0	1	2
Maintain and clear lots of existing trails using helicopters and motorized tools (chainsaws, rock drills) to support access to challenging to reach places.	-2	-1	0	1	2
Discontinue maintenance of some trails to limit the number of trails in wilderness.	-2	-1	0	1	2

Tradeoff 3: SMW managers face choices between preserving natural conditions (e.g., a landscape with old growth trees, landscapes without non-native plants and animals), and maintaining free-willed ecosystems with minimal human intervention (e.g., limited restorative plantings, without chemical treatments, unsuppressed wildfire).

	Strongly Oppose	Oppose	Neutral	Support	Strongly Support
Re-locate threatened and endangered species to help species adapt to climate change.	-2	-1	0	1	2
Spray (to kill) or remove non-native plants and trees.	-2	-1	0	1	2
Suppress wildfire to protect old growth forests.	-2	-1	0	1	2
Avoid intervening in the ecosystem to let it transform with a changing climate on its own.	-2	-1	0	1	2
Use management-ignited fire to reduce future high-intensity fires.	-2	-1	0	1	2

15. Please indicate your level of agreement or disagreement with each of the statements. *(select one answer for each statement)*

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
This is the best place for the activities I like to do.	-2	-1	0	1	2
No other place can compare to this place.	-2	-1	0	1	2
I wouldn't substitute any other place for the recreation activities I do in this place.	-2	-1	0	1	2
Compared to other National Parks in the Pacific Northwest, North Cascades should be the least developed and the most challenging to access.	-2	-1	0	1	2

16. Please rate how true the following statements are according to your trip in Stephen Mather T. Wilderness. *(select one answer for each statement)*

In planning and during my trip to the Stephen T. Mather Wilderness, I was motivated to...

	Not at all True	Slightly True	Moderately True	Very True	Completely True
...gain a greater sense of self-reliance through challenge.	1	2	3	4	5
...to see what I am capable of doing.	1	2	3	4	5
...to test my abilities through challenge.	1	2	3	4	5
...strengthen family or social bonds.	1	2	3	4	5
...be with people who share similar values.	1	2	3	4	5
...increase my sense of belonging with others.	1	2	3	4	5
...enjoy the sounds of nature.	1	2	3	4	5
...get to know the environment.	1	2	3	4	5
...cultivate a closer relationship with the natural world.	1	2	3	4	5
...to experience life without everyday technologies.	1	2	3	4	5
...to be in an environment mostly free of human-made intrusions.	1	2	3	4	5
...be away from crowds of people.	1	2	3	4	5
...experience minimal rules.	1	2	3	4	5
...roam wherever I want.	1	2	3	4	5
...make my own plans.	1	2	3	4	5

17. Please rate your support for the following techniques of distributing (or rationing) parking at this location.

	Strongly Oppose	Oppose	Neutral	Support	Strongly Support
First-come, first-served (i.e the first arrive get campsites)	-2	-1	0	1	2
Increasing the fee/cost for reserving a campsite	-2	-1	0	1	2
Online advance reservations (i.e., reservations on Recreation.gov)	-2	-1	0	1	2
Online lottery (i.e., an advance lottery on Recreation.gov)	-2	-1	0	1	2
Combination of techniques (e.g., 50% reservation and 50% first come, first served)	-2	-1	0	1	2
Combination of timeframes (e.g., 25% available 6 months-in-advance, 50% available 1 month-in-advance, 25% available first come, first served on the day of arrival)	-2	-1	0	1	2

18a. (If 4a = NO) Are you interested in backcountry camping in the SMW in the future?

☐ YES

☐ NO

18b. (If 4a = YES or 18a = YES) What is your preferred booking window (i.e., the optimal amount of days, weeks, or months campsite reservations are available prior to arrival) for a backcountry camping permit in the SMW? **Enter 0 (zero) for day-of booking/first come, first served or a decimal for the amount of weeks, if less than 1 month (e.g., 1 week = .25 months).**

Number of Months _____

18c. (If 4a = YES or 18a = YES) What is your maximum booking window (i.e., the maximum amount of days, weeks, or months you are able to plan in advance prior to arrival) for a backcountry camping permit in the SMW? **Enter 0 (zero) for day-of booking/first come, first served or a decimal for the amount of weeks, if less than 1 month (e.g., 1 week = .25 months).**

Number of Months _____

19a. If you were to visit North Cascades National Park in the future, if a transit (bus) service existed, with service to the park's major destinations, how likely would it be that you would use such a service?

Not at all Likely	Slightly likely	Moderately Likely	Very Likely	Extremely Likely	Undecided
☐	☐	☐	☐	☐	☐

19b. If you answered "Not at all likely" or "Slightly likely", why might you not be interested in using a transit (bus) service?

20. Please indicate your level of agreement or disagreement with each of the statements regarding guides and guided trips. (select one answer for each statement).

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Guides provide opportunities for people to access the wilderness that would not otherwise be possible.	-2	-1	0	1	2
There are too many guided trips and outfitters in the wilderness.	-2	-1	0	1	2
Guided trips help support appropriate behaviors of visitors in the wilderness.	-2	-1	0	1	2

21. In what year were you born? _____

22. Do you primarily reside in the United States? (Please respond "yes" or "no")

- ☐ YES, what is your primary zipcode? _____
- ☐ NO, what is your country of origin? _____

23. What is your race and/or ethnicity? Select all that apply and enter additional details in the spaces below.

- ☐ **American Indian or Alaska Native** - Provide details below.
- ☐ Enter, for example, Navajo Nation, Blackfeet Tribe of the Blackfeet Indian Reservation of Montana, Native Village of Barrow Inupiat Traditional Government, Nome Eskimo Community, Aztec, Maya, etc.

- ☐ **Asian** - Provide details below.
- ☐ Chinese
 - ☐ Vietnamese
 - ☐ Asian Indian
 - ☐ Korean
 - ☐ Filipino
 - ☐ Japanese
 - ☐ Enter, for example, Pakistani, Hmong, Afghan, etc.
-
- ☐ **Black or African American** - Provide details below.
- ☐ African American
 - ☐ Nigerian
 - ☐ Jamaican
 - ☐ Ethiopian
 - ☐ Haitian
 - ☐ Somali
 - ☐ Enter, for example, Trinidadian and Tobagonian, Ghanaian, Congolese, etc.
-
- ☐ **Hispanic or Latino** - Provide details below.
- ☐ Mexican
 - ☐ Puerto Rican
 - ☐ Salvadoran
 - ☐ Cuban
 - ☐ Dominican
 - ☐ Guatemalan
 - ☐ Enter, for example, Colombian, Honduran, Spaniard, etc.
-
- ☐ **Middle Eastern or North African** - Provide details below.
- ☐ Lebanese
 - ☐ Syrian
 - ☐ Iranian
 - ☐ Iraqi
 - ☐ Egyptian
 - ☐ Enter, for example, Moroccan, Yemeni, Kurdish, etc.
-
- ☐ **Native Hawaiian or Pacific Islander** - Provide details below.
- ☐ Native Hawaiian
 - ☐ Tongan
 - ☐ Samoan
 - ☐ Fijian
 - ☐ Chamorro
 - ☐ Marshallese
 - ☐ Enter, for example, Chuukese, Palauan, Tahitian, etc.
-
- ☐ **White** - Provide details below.
- ☐ English
 - ☐ Italian
 - ☐ German

- ☐ Polish
 - ☐ Irish
 - ☐ Scottish
 - ☐ Enter, for example, French, Swedish, Norwegian, etc.
-

24. Which category best represents your annual household income?

- 25. Less than \$25,000
 - 26. \$25,000 to \$34,999
 - 27. \$35,000 to \$49,999
 - 28. \$50,000 to \$74,999
 - 29. \$75,000 to \$99,999
 - 30. \$100,000 to \$149,999
 - 31. \$150,000 to \$199,999
 - 32. \$150,000 to \$199,999
 - 33. Do not wish to answer
-

25. Do you have any recommendations for planning or managing Stephen T. Mather Wilderness? If so, please explain in the space below:

Interviewer script:

Thank you for your time.

Appendix B: Email Prompts for Overnight Surveys

First Email *(Sent on Mondays)*

Subject: Response Requested - North Cascades National Park Wilderness Study

Email body:

Dear Visitor,

I hope that your overnight trip in North Cascades National Park went great! The University of Montana is cooperating with the National Park Service in conducting a visitor survey on the Stephen T. Mather Wilderness. The visitor use survey will support wilderness stewardship planning, including a future management plan.

We kindly ask you to participate, if you are 18 years or older. This questionnaire will take about 15 minutes to complete. Your participation is voluntary, you may discontinue the survey at any time, and there are no risks associated with participating in this survey. Your survey answers will be kept anonymous.

[Survey link]

Before you begin, I would like to let you know that this survey has been approved by the U.S. Office of Management and Budget. It is important to note that a Federal agency may not conduct or sponsor, and you are not required to respond to, a collection of information unless it has a valid OMB control number. The control number for this collection is 1024-0224 and this number is valid through 11/30/2024. Secondly, your participation is voluntary and your name will never be connected with your individual responses. This survey will take about fifteen minutes of your time today.

[Survey link]

Sincerely,
Will Rice, PhD

Follow this link to the Survey:

[Survey link]

Or copy and paste the URL below into your internet browser:

[Survey URL]

Follow the link to opt out of future emails:

[Link to unsubscribe]

First Reminder Email *(Sent three days later, the following Thursday)*

Subject: Reminder: Please help North Cascades National Park with Wilderness Study

Email body:

Dear Visitor,

I recently reached out to you about your overnight trip to North Cascades National Park. This is a friendly reminder to consider our request below.

The University of Montana is cooperating with the National Park Service on conducting a visitor survey on the Stephen T. Mather Wilderness. The visitor use survey will support wilderness stewardship planning, including a future management plan.

[Survey link]

We kindly ask you to participate if you are 18 years or older. This questionnaire will take about 15 minutes to complete. Your participation is voluntary, you may discontinue the survey at any time, and there are no risks associated with participating in this survey. Your survey answers will be kept anonymous.

Before you begin, I would like to let you know that this survey has been approved by the Office of Management and Budget. It is important to note that a Federal agency may not conduct or sponsor, and you are not required to respond to, a collection of information unless it has a valid OMB control number. The control number for this collection is 1024-0224 and this number is valid through 11/30/2024. Secondly, your participation is voluntary and your name will never be connected with your individual responses. This survey will take about fifteen minutes of your time today.

[Survey link]

Sincerely,
Will Rice, PhD

Follow this link to the Survey:

[Survey link]

Or copy and paste the URL below into your internet browser:

[Survey URL]

Follow the link to opt out of future emails:

[Link to unsubscribe]

Second Reminder Email *(Sent five days after first reminder on the following Tuesday)*

Subject: Second Reminder: Please complete North Cascades wilderness survey

Email body:

Dear Visitor,

I recently reached out to you about your overnight trip to North Cascades National Park. This is a friendly second reminder to consider our request below.

The University of Montana is cooperating with the National Park Service on conducting a visitor survey on the Stephen T. Mather Wilderness. The visitor use survey will support wilderness stewardship planning, including a future management plan.

[Survey link]

We kindly ask you to participate if you are 18 years or older. This questionnaire will take about 15 minutes to complete. Your participation is voluntary, you may discontinue the survey at any time, and there are no risks associated with participating in this survey. Your survey answers will be kept anonymous.

Before you begin, I would like to let you know that this survey has been approved by the Office of Management and Budget. It is important to note that a Federal agency may not conduct or sponsor, and you are not required to respond to, a collection of information unless it has a valid OMB control number. The control number for this collection is 1024-0224 and this number is valid through 11/30/2024. Secondly, your participation is voluntary and your name will never be connected with your individual responses. This survey will take about fifteen minutes of your time today.

[Survey link]

Sincerely,
Will Rice, PhD

Follow this link to the Survey:

[Survey link]

Or copy and paste the URL below into your internet browser:

[Survey URL]

Follow the link to opt out of future emails:

[Link to unsubscribe]

National Park Service
U.S. Department of the Interior



[Natural Resource Stewardship and Science](#)

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