

Fad or Renaissance? Motivational and demographic characteristics of USDA Forest Service recreationists during and after the pandemic[☆]

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ABSTRACT

While there have been a host of studies investigating the COVID-19 pandemic's influence on outdoor recreation, few have investigated the socio-demographic composition and motivations of visitors who increased their outdoor recreation during this period and if these users will continue recreating at the same level as the pandemic wanes. This study surveyed visitors to the Nantahala and Pisgah National Forests (NPNF) within the US state of North Carolina to identify if rising outdoor recreation participation is solely a result of the pandemic or more indicative of a renaissance. Demographic and motivational differences between those whose recreation decreased, stayed the same or increased during the pandemic were also analyzed to see if these patterns remain stable one year after the pandemic. The sample of 1594 visitors from Georgia (n = 483), South Carolina (n = 682), and North Carolina (n = 429) indicate growth in visitation to the NPNF is not just a fad but more of a renaissance with continued high levels of visitation forecasted after the pandemic. Results also show that outdoor recreationists characterized as more ethnically diverse with lower income and educational levels had visitation levels to the forest that increased during the pandemic compared to the outdoor recreationists who were White, more affluent, and highly educated. However, these changes appear to reverse moving out of the pandemic as these more diverse users mention having greater structural, interpersonal, and intrapersonal constraints. Managers who seek social and environmental justice with the provisioning of outdoor recreation should follow-up with these more diverse users to better understand their satisfaction with the FS experience during the pandemic and identify strategies to help them negotiate constraints limiting their outdoor recreation. *Management implications:* For public land managers, these findings suggest that increased visitation levels are here to stay. The results also suggest that the pandemic provided users with more diverse backgrounds the space and time to recreate during the pandemic. Unfortunately, it appears that the challenges of everyday life may limit this group from continuing to recreate at the level they did during the pandemic. Managers should take advantage of this opportunity to try to understand these more diverse users and why they anticipate their participation in outdoor recreation dropping as we move out of the pandemic.

1. Introduction

Prior to the COVID-19 pandemic, nature-based tourism was one of the fastest-growing tourism sectors, and many public lands and protected areas had become important tourist destinations (Winter, Selin, Cervený, & Bricker, 2019). As of 2015, it was reported, protected areas around the world received eight billion visits annually, resulting in \$600 billion in visitor spending (Balmford et al., 2015). With these levels of visitation, some researchers were even claiming that our public lands

were being “loved to death” (Wolf, Croft, & Green, 2019). While the COVID-19 pandemic had heterogeneous impacts on outdoor recreation across space and time with many countries and regions such as Spain and Poland initially closing outdoor recreation opportunities out of concern for spreading the Coronavirus (Ciesielski et al., 2023; Pröbstl-Haider, Gugerell, & Maruthaveeran, 2023; Seifert et al., 2023), within the United States, the COVID-19 pandemic seemed to add ‘fuel to the fire’ regarding growth in outdoor recreation (Beery et al., 2021; Ferguson et al., 2022; Outdoor Industry Association, 2021; Rice, Taff,

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Lawhon, & Newman, 2021). During the pandemic, public lands within the US became places of refuge for people as they sought safe places to engage in outdoor recreation amidst pandemic-related restrictions on indoor entertainment (Ferguson et al., 2022) with green infrastructure being increasingly recognized as paramount of mental health (Bristowe & Heckert, 2023). For example, the United States Forest Service reported 25 million total site visits in 2020, 7 million more than the 18 million national forest visits in 2019 (United States Department of Agriculture Forest Service, 2021). The growth in outdoor recreation was not limited to the U.S. with countries such as Ireland seeing more use of walking trails in 2020 (Power, Lambe, & Murphy, 2023) and Hungary noticing more park visitors in 2020 as well (Csomós, G., Borza, E. M., & Farkas, 2023).

Stemming from this growth in outdoor recreation during the pandemic, there have been a host of studies to investigate this increase in outdoor participation and understand certain characteristics of the new group of outdoor recreationists like who they are and how they recreate (Pröbstl-Haider et al., 2023). For example, Ferguson et al. (2022, pp. 1–20) used empirical data to show significant changes in visitation volume and characteristics in 2020 across the New England National Forest system. Their study found overall visitation to increase within the New England National Forest system with a noticeable increase in visitor use of dispersed recreation settings and out-of-state recreationists. Moving from a regional study to a nationwide level, Taff, Rice, Lawhon, and Newman (2021) examined recreationists who started, stopped, remained the same, or remained non-existent at the onset of the pandemic. Taff et al. found those recreationists that started after the pandemic were the least ethnically diverse of all the groups and those that stopped recreating after the pandemic were the most ethnically diverse (Taff et al., 2021). In a study more focused on the quality of the recreational experiences offered during the pandemic, Landry, Bergstrom, Salazar, and Turner (2021) found that users were willing to take risks to visit public outdoor recreation sites during the pandemic but had lower quality experiences based on finding a lower consumer surplus in their travel cost model due to the perceived crowding of outdoor recreation sites during the pandemic.

While these studies help to provide a picture of the pandemic's influence on outdoor recreation within the U.S., important questions remain. First, will these changes highlighted by Ferguson and Taff hold, or will they fade when other pressures and obligations of life resume? There is a possibility that this increase in outdoor recreation served as a substitute to other forms of leisure and recreation that people were restricted from participating in due to pandemic's restrictions on sports, concerts, and other public social gatherings (Rice et al., 2021). For example, Csomós, Borza, and Farkas (2023) found park visitation in Hungary to go down in 2021 compared to 2020. As pandemic-related restrictions lift and the US returns to pre-pandemic "norms," people could turn away from outdoor recreation and resume activities that were hindered by the pandemic. Rice et al. (2021) study on outdoor recreation as a whole (anything from camping to gardening) found that over 80% of new outdoor recreationists indicated that their participation in activities was likely here to stay. However, it is unclear if those findings are relevant to public lands, such as US National Forests, because Rice et al.'s study included outdoor recreation activities that were not necessarily applicable including gardening, for example. Second, are there demographic and motivational differences underlying the pandemic's influence on recreational behavior? Taff and Ferguson make it clear that recreation grew during the pandemic, but little is known about the motivations driving recreation during the pandemic and if the motivational and demographic makeup of recreationists will shift after the pandemic.

With these questions in mind, this study seeks to identify: 1) if the rising outdoor recreation participation on the Nantahala Pisgah National Forest (NPNF) was isolated to the pandemic period or more indicative of a sustained increase in outdoor recreation participation, 2) what are the demographic and motivational differences between those whose

recreation decreased, stayed the same or increased during the pandemic, and 3) if these patterns remain stable one year after the pandemic. As recreation and visitation increase, the US Forest Service has the challenge to provide high-quality outdoor recreation experiences while simultaneously protecting important natural resources (Ferguson et al., 2022). Despite new research being published on the impact of COVID-19 on visitation to and recreational use of national forests, much still remains unknown. Hence, this study sought to address how COVID-19 has influenced people's visitation to and recreational use of a national forest and what if any are the long-term implications of these impacts on people's visitation and recreational use of the National Forest System.

2. Literature review

2.1. Historical and current developments in US outdoor recreation

To provide the context for the pandemic's influence over outdoor recreation, one must examine historic trends. In the early 20th century, outdoor recreation was predominantly a leisure activity only for the affluent (Cordell & Super, 2000). Not until after World War II was there a societal shift due to increased accessibility from improved transportation, industrialization, institutionalizing holiday time off, and other factors that simultaneously worked together to encourage people to associate outdoor recreation as a desired form of leisure (Cordell & Super, 2000). In the 1960s, activities like hiking, driving for pleasure, and picnicking were widely enjoyed by Americans. As equipment technology improved, and as the US entered the 21st century, activities like snow skiing/snowboarding, canoeing/kayaking, and cycling experienced increased participation while more traditional recreation activities such as horseback riding and hunting declined (Cordell & Super, 2000). By 2009, activities that remained at the top of the list in participation included walking for pleasure, family gatherings outside, and gardening for pleasure with activities orientated toward viewing and photographing nature experiencing the fastest-growing numbers of participation (Mahler, 2009; White et al., 2016). Fast-forwarding ten years to 2019 right before the pandemic, the Outdoor Industry Association (OIA) (2020) reported, the outdoor recreation participation rate in the US had slightly increased during a 3-year span from 2017 to 2019, averaging a 2.1% annual increase (OIA, 2020, p. 2020).

With historic and modern influences in the background, the COVID-19 Pandemic resulted in a transformational shift in recreational trends with many studies finding increased demand for close-to-home outdoor recreation opportunities (Alba et al., 2022; OIA, 2021; Rice et al., 2020). Due to closures and risks associated with being indoors during the COVID-19 pandemic, people turned to the outdoors for social and physical engagement. The OIA (2021) reported the top reasons for starting an outdoor activity during the pandemic included getting exercise, staying healthy, and getting out of the house. Those who participated in an outdoor activity for the first time did so close to home and with a low barrier to entry as many preexisting social and work obligations were removed. Despite the possibility of traditional barriers reemerging as life gets back to normal, the OIA estimates that sixty percent of those who reported starting or resuming an outdoor activity plan to continue once all pandemic restrictions lift (OIA, 2021) with Rice et al. (2021) estimating as high as 80% will continue recreating at their new levels.

While there is general consensus around the continued growth of outdoor recreation, little is known about the motivational and demographic characteristics of this new type of outdoor recreationist and how they compare to those who typically engaged in outdoor recreation before the pandemic. With this in mind, the next section of the literature review goes over past demographic trends and common motivations for outdoor recreation before the pandemic, so that the trends identified within the study are placed within the context of outdoor recreation before the pandemic.

2.2. Demographic trends in US outdoor recreation

Those engaging in outdoor recreation have demographic characteristics that differ from the general population. In Cordell and Super's (2000) publication, *Trends in America's Outdoor Recreation*, it was reported that by 1983, a number of changes in the demographic profiles of outdoor recreationists did not keep pace with the changing profile of Americans in general. Those who participated in outdoor recreation tended to be White, higher educated, and wealthier (Cordell & Super, 2000). These trends were enforced by a 2012 national study, as part of the 2010 Renewable Resources Planning Act Assessment by the USFS. The USFS reported that participation in activities within US Forests was significantly higher among Whites, people with at least some college completed, and of higher income than compared to the general population. (Cordell, 2012). Finally, in the year before the pandemic, OIA's Participation Report (2020) stated that in 2019 African American/Black and Hispanic American participation numbers had increased over the last decade, though participation rates still did not represent the diversity of the US population.

Several studies have examined the sociodemographic characteristics of those beginning or ending participation in outdoor recreation during the pandemic. Landry et al. (2021) found a reduction in trips per participant to public outdoor recreation during the year 2020 as compared to trips taken before the pandemic. Larson et al. (2021), in their early pandemic study, found declines in urban park visitation especially for socially vulnerable communities. In fact, African American/Black, Indigenous, People of Color and/or low socioeconomic status reported lower levels of urban park use before the pandemic and the COVID pandemic appeared to exacerbate pre-existing disparities in urban park use. Further, Taff et al. (2021) found that those newly engaging in outdoor recreation during the early pandemic years were less ethnically diverse than existing outdoor recreationists, were younger, and had greater incomes than those not engaging in recreation or stopping their recreation participation. These findings are in contrast to those reported by the OIA (2021)—using data from a general population survey—that found new recreationists during the pandemic were younger, more likely to be female, and slightly more ethnically diverse (OIA 2021). Taff et al. (2021) noted that OIA weighted their sample to match the US population for gender, ethnicity, age, household income, and region and that weighting may explain the differences between these studies. Even so, this disparity in findings highlights the continuing need for research to understand the sociodemographic characteristics of existing and new outdoor recreationists and if demographic changes found during the pandemic will hold moving forward.

2.3. Motivations for outdoor recreation

Due to the novelty of the pandemic, there is a gap in the outdoor recreation and tourism literature analyzing the motivations and barriers for these new recreationists since the pandemic and how their motivations differ from those recreating before the pandemic. Motivations are the “push-factors” which determine why people engage in certain leisure activities (Manfredo, Driver, & Tarrant, 1996). These motivational factors center around physical, mental, and psychological needs that can be met in nature. Manfredo et al. (1996) established the Recreation Experience Preference Scale (REPS), which focuses on the desired goal states that are attained through participation in leisure. The researchers provided a framework for motivations through REPS that are used by countless studies (Humagain & Singleton, 2021; White, 2008; Whiting, Larson, Green, & Kralowec, 2017). In pre-pandemic studies, “to be outdoors” and “to experience nature” were reported as significant motivators for outdoor recreation (Cordell, 2012; Cordell & Super, 2000; Whiting et al., 2017). Additionally, Whiting et al. (2017) found that social interactions were rated as the strongest motivation for state park visits, yet fitness and physical health-related motivations were the

lowest-ranked motivations.

The pandemic created unprecedented conditions for outdoor recreation and so it is important to know if the motivations of those whose outdoor recreation increased during the pandemic are different from what previous studies have found. Humagain and Singleton (2021) attempted to define tourists' motivations, barriers, and negotiations regarding outdoor recreation trips during the initial COVID-19 wave, in the summer of 2020, through a sixteen-person focus group. COVID-related motivations emerged (i.e. “to feel safe in an outdoor environment,” “experience normalcy,” etc.) that were not previously relevant for outdoor recreationists. Interestingly, Humagain and Singleton (2021) found novelty, experience, and exploration as the most repeated themes in the focus group sessions. Additionally, Rice et al. (2021) found that new outdoor recreationists indicated participating in outdoor activities to fulfill motivations predominantly associated with health and well-being, such as seeking an improved sense of relaxation. There is also the possibility that individuals are motivated to participate in outdoor recreation due to the desire to gain social return via posting on social media of them participating in outdoor recreation. Beall et al. (2021) found that the desire for social return better predicted intent to engage in ecotourism than one's environmental values. This finding leads to the possibility that outdoor recreationists' motivations could significantly differ from previous trends due to a transformational shift from the pandemic and other societal influences.

Related to motivations, one's place attachment is an important predictor of recreational behavior (Budruk & Stanis, 2013). Place attachment is the subjective, emotional, and symbolic meanings associated with natural places and the personal bonds people form with specific places or landscapes (Williams & Stewart, 1998). There are multiple dimensions that can go into defining place attachment (Beery & Jönsson, 2017; Ramkissoon et al., 2012). The two original dimensions of place attachment are place dependence - a functional attachment that illustrates how a place meets the needs on a recreational level (i.e., offers utility for rock climbing or kayaking) and place identity - an emotional attachment where a place is centered around emotions and relationships that give meaning and purpose to life (Williams & Vaske, 2003). Due to the emphasis of nature in outdoor recreation on public lands, this article also uses the dimension of nature bonding - connections to the natural world (Raymond, Brown, & Weber, 2010) - to define place attachment in the scope of outdoor recreation. While place attachment is one of the most prominent constructs within the large outdoor recreation, tourism, and environmental psychology literature (Boley et al., 2021), little is known about how place attachment and its dimensions of place identity, place dependency, and nature bonding vary by those who recreated more during the pandemic and what place attachment will look like among those who choose to participate in outdoor recreation going forward.

2.4. Barriers to outdoor recreation

As important as it is to understand why people recreate outdoors, it is equally important to understand why they do not. Barriers to outdoor recreation and tourism behavior consist of three dimensions: intrapersonal, interpersonal, and structural (Crawford & Godbey, 1987). Crawford and Godbey (1987) define intrapersonal barriers as psychological attributes on the individual level that affects leisure preferences. These types of intrapersonal barriers can include fear, anxiety, attitudes, or general lack of interest that constrain one's recreational behavior. The next dimension of barriers is interpersonal. Interpersonal barriers focus on how other humans act as barriers to recreating. Interpersonal barriers can be the unavailability of companions or partners for participation or can be the presence of other individuals that make one feel uncomfortable while recreating. Lastly, structural barriers are those types of situational life barriers that limit one's ability to recreate. These structural barriers include a lack of leisure time, the financial cost of recreation, and obligations to work and family that may limit recreation

(Crawford & Godbey, 1987).

In a North Georgia-based survey, Parker and Green (2016) found the structural barriers of lack of time, lack of information, facility condition, and distance to the national forest were the most common barriers to engaging in outdoor recreation activities regardless of demographic characteristics. Even so, Ghimire, Green, Poudyal, and Cordell (2014), using data from a 2004 study, found that ethnic minorities and marginalized groups in American society face more barriers to outdoor recreation compared to their respective counterparts. These barriers included time, money, personal safety, language, and transportation. Among ethnic groups, African Americans/Blacks felt more hindered by intrapersonal barriers and Asians felt more hindered by interpersonal barriers compared to Whites (Ghimire et al., 2014). Cordell's (2012) study differed slightly by finding that African Americans/Blacks felt more hindered from participating in their favorite recreation activities than Whites for all of the reasons except, "having no one with whom to do activities." Johnson, Bowker, Green, and Cordell (2007) also found African Americans/Blacks reported not participating in their favorite activities due to a lack of awareness of opportunities. Notably, no recent studies have examined whether the influence of these barriers changed during the pandemic. It could be possible that during the beginning of the pandemic, some structural barriers to engaging in recreation, such as work obligations lessened and allowed for increased participation in outdoor recreation. Additionally, this speculation could extend to the notion that as pandemic restrictions continue to subside, structural barriers would increase causing recreationists to potentially decrease forest visitation. Therefore, it is important to look at the barriers faced by these groups to see what future recreational behavior may look like.

In summary, the literature review reveals historically, motivators centered around being outdoors and in nature dominate reasons for outdoor recreation. However, studies suggest these motivations may be shifting (Beall et al., 2021; Humagain & Singleton, 2021). Additionally, while the outdoor recreation rates within the US have been steady or slightly increasing, the diversity in sociodemographic characteristics does not resemble the US population with contradictory findings on how

the COVID-19 pandemic has affected these trends. With these gaps in mind, this study seeks to identify: 1) if the rising outdoor recreation participation is solely a result of the pandemic or more indicative of a renaissance in outdoor recreation, 2) what are the demographic and motivational differences between those whose recreation decreased, stayed the same or increased during the pandemic, and 3) if these patterns remain stable one year after the pandemic.

3. Methods

3.1. Study area

We sought to understand 1) if rising outdoor recreation participation on the Nantahala Pisgah National Forest (NPNF) was isolated to the pandemic period or more indicative of a sustained increase in outdoor recreation participation, 2) what are the demographic and motivational differences between those whose recreation decreased, stayed the same or increased during the pandemic, and 3) if these patterns remain stable one year after the pandemic. We surveyed visitors of the Nantahala Pisgah National Forests (NPNF) in North Carolina, USA to ascertain the pandemic's influence over their recreational behavior. The NPNF is located in the Appalachian Mountain Range in the western region of North Carolina (Fig. 1).

3.1.1. Overview of COVID-19 pandemic regulations in western North Carolina

There were more than 293,000 documented cases of the Coronavirus and 3265 deaths in the 18 counties within North Carolina that border the NPNF between 2020 and 2023. Statewide, North Carolina had a total of 3.5 million reported cases and 29,059 reported deaths (USA Facts, 2023). On March 10, 2020, North Carolina Governor Roy Cooper declared a state of emergency and by April 2020 had initiated a statewide stay-at-home order (UNC, 2021). However, socially distanced outdoor recreation including walking, hiking, running, golfing, and biking were specifically outlined as approved activities making the

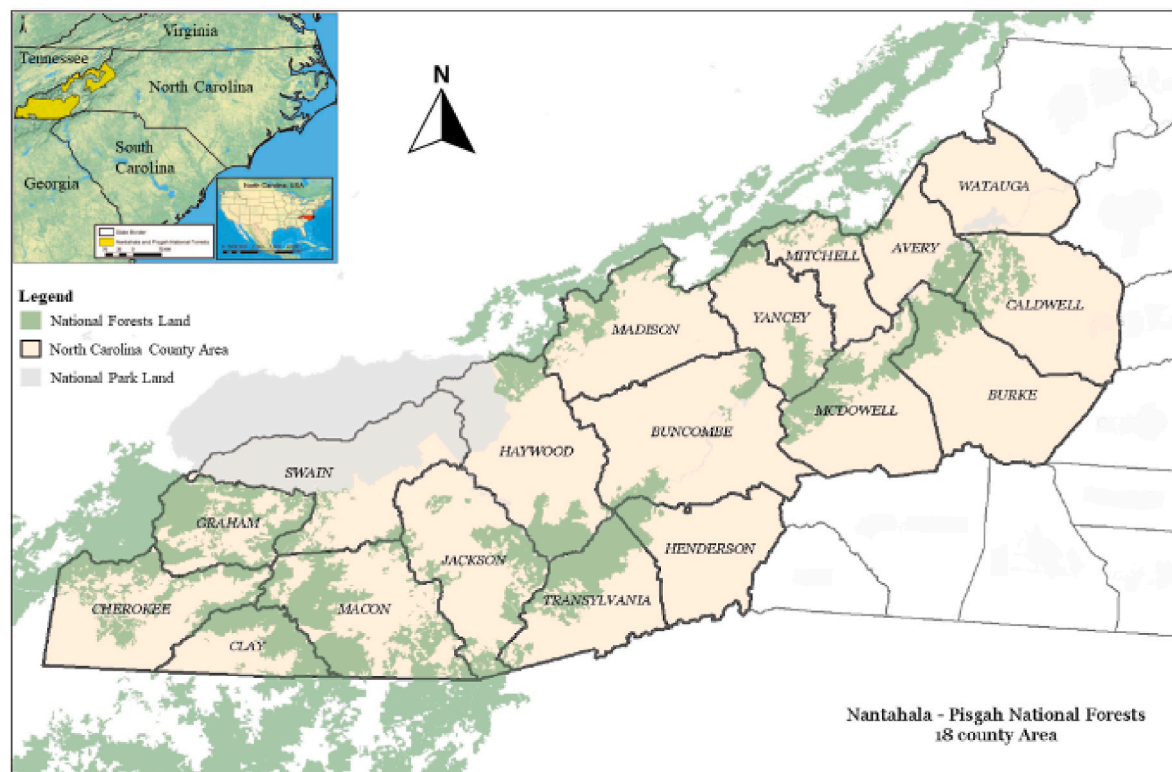


Fig. 1. Location of the nantahala and pisgah national forests and gateway communities in North Carolina (Schlichting & Mercer, 2011; USFS, 2013).

adjacent NPNF an important piece of green infrastructure for locals and those in surrounding states that were only a couple hour drive away (Supplementary Material 1). Throughout the initial ten months of the COVID pandemic, Gov Copper took a more restrictive approach in managing the pandemic as compared to the then US President Trump. With that said, no interstate travel was restricted during any point of the pandemic lockdown like in the Northeastern states including New York and Pennsylvania and the NPNF stayed open to visitors throughout the pandemic (NBCUniversal News Group, 2020).

3.2. Data collection

The NPNF was chosen due to its diversity in outdoor recreation activities, recreation opportunities that accommodate a wide range in skill levels, and its location within a two-to-three-hour drive of major cities in three states (Atlanta, GA, Charlotte, NC, and Greenville, SC). Residents of Georgia, North Carolina, and South Carolina were surveyed in July and August 2022 to assess their outdoor recreation behavior and motivations beforehand and during the early and later years of the COVID-19 pandemic. Data was collected through an online survey via Qualtrics and their panel members from these three states. To qualify for the study, residents from Georgia, North Carolina, and South Carolina were required to be at least 18 years old and to have visited either the Nantahala or Pisgah National Forests between March 2020 and summer 2022. This ensured that all study participants had actually visited the NPNF during the pandemic. Qualtrics ensured the quality of our responses through speeding checks and removing invalid responses. Throughout the data collection period, 5274 people clicked on the survey, but only 31% or 1638 qualified to participate based on having previously recreated on the NPNF since March 2020. The sample consisted of 682 recreationists from South Carolina, 483 from Georgia, and 429 from North Carolina ($n = 1594$).

The survey contained 42 questions comprising variables and psychometric scales from the existing literature across three main sections: 1) visitation behavior (e.g., gateway communities visited within a trip, trip type and length, trips frequency, activities participated in during trips, frequency of activities); 2) reasons for recreating in the NPNF (e.g., recreation activity degree of centrality to life, motivators, place attachment, evaluation of USFS management, willingness to pay a fee, overall satisfaction with NPNF management, level of perceived crowdedness, potential barriers to travel, social media use); and 3) demographics (e.g., year born, residence ZIP code, gender, race/ethnicity, children in household, education level, income level) (Survey provided in Supplementary Material 2).

3.3. Data analysis

To address the first research question about participation changes during the Pandemic, respondents were asked to state the number of trips they took (or planned to take) to the NPNF for three time periods: pre-pandemic (e.g., January–December 2019), during pandemic (e.g. July 2021–June 2022), and post-pandemic (e.g., July 2022–June 2023). We chose to use a year range from the date the survey was released for a higher probability of accurate responses from recreationists. The survey was released at the beginning of July 2022. When analyzing the reported number of trips per timeframe, we limited seasonal visitation to 90 trips a season to reduce outliers since it is only possible to visit the NPNF for 90 days based on there being roughly 30 days per month and 3 months per season.

We grouped respondents into three patterns of NPNF visitation—increasing, staying the same, or decreasing during the pandemic—by subtracting pre-pandemic visitation from visitation during the pandemic (i.e., during pandemic visitation minus pre-pandemic visitation). Negative numbers were indicative of reduced visitation while positive numbers represented increased visitation with zero indicating that visitation stayed the same. Chi-square and Analysis of

Variance Analysis (ANOVA) tests were conducted on the resulting groupings to identify any associations between demographic factors, including race, income, and education, and visitation patterns during the pandemic. Using the same method to calculate and segment recreationists during the pandemic, recreationists were organized again into three groups based on how their self-reported visitation is anticipated to change after the pandemic. This result was calculated by subtracting during-pandemic visitation from after-pandemic visitation. Those with negative values were assigned to the decrease visitation group, those with values of zero were assigned to the no-change group, and those with positive values were assigned to the increase visitation group. Additional chi-square tests and ANOVAs were carried out, as well, to understand how trends changed between demographic variables and visitation after the pandemic.

To answer the second question of how the motivations, place attachment, and barriers differed between groups that decreased, increased, or maintained their visitation during the pandemic, ANOVAs were conducted to test for statistically significant differences among the groups for each factor. An additional series of ANOVAs were conducted for the three groups of recreationists based on their anticipated visitation to the NPNF (decreasing, increasing, or maintaining) over the next year.

4. Results

4.1. Visitation trends during the pandemic

There is an overall gradual increase in total trips per year to the NPNF from pre-pandemic to post-pandemic (Table 1). The sample means ranged from 4.6 trips per year pre-pandemic to 5.1 trips per year after the pandemic. In all three time periods, visitation was greatest in the summer and lowest in the winter. While the mean differences in visitation are modest, the growth in visitation is more evident across the entire sample where pre-pandemic visitation was estimated at 7332 visits to the NPNF (4.6×1638), and during and post-pandemic visitation is estimated at 7651 (4.8×1638) and 8129 visits (5.1×1638), respectively.

Recreationists were segmented into three distinct visitation groups (e.g., decrease, stay the same, and increase) based on how their visitation to the NPNF changed during the pandemic. Results revealed 34% of the sample reduced visitation during the pandemic with a median drop of 2 trips per year ($n = 550$), 26 percent of the sample kept recreating at the same level ($n = 418$), and 41 percent of the sample increased recreation with a median increase of 2 trips per year ($n = 670$) (Table 2).

4.2. Demographic trends during the pandemic

There were significant differences in visitation among the race and ethnicity categories of African Americans/Blacks, and Whites. African American/Black recreationists were significantly more likely to be in the

Table 1
COVID-19 pandemic effects on visitation to the NPNF.

Average # of Trips Per Season ($n = 1638$)	Pre-Pandemic (Jan 2019–Dec 2019)		During Pandemic (July 2021–June 2022)		Post-Pandemic (July 2022–June 2023)	
	M	SD	M	SD	M	SD
Winter (Dec–Feb)	0.9	2.8	0.7	1.7	0.9	2.9
Spring (Mar–May)	1.1	3.3	1.1	3.7	1.2	3.7
Summer (Jun–Aug)	1.4	3.6	1.9 ^a	5.0	1.9 ^b	3.9
Fall Trips (Sept–Nov)	1.2	2.2	1.0	1.7	1.1	2.5
Average Trips Per Year Per Person	4.6	8.7	4.8	9.0	5.1	11.3

^a Jul and Aug 2021 + Jun 2022

^b Jul and Aug 2022 + Jun 2023

Table 2

Percent of respondents whose visitation decreased, stayed the same or increased during the pandemic.

	N	%	Mean Change in Trips	SD	Median Change in Trips
Decreased Visitation	550	33.6	−4.5	10.8	−2.0
No Change	418	25.5	0.0	0.0	0.0
Increased Visitation	670	40.9	4.0	9.2	2.0

‘increase recreation’ category with this demographic representing 28.8% of the sample for those who increased visitation to the NPNF during the pandemic compared to only representing 19.6% who visitation to the NPNF decreased during the pandemic. Conversely, White recreationists were more likely to report a decrease in visitation to the NPNF (Table 3) (see Table 5).

Notably, American Indians/Alaskan Natives were close to having a significant increase with their representation in the increased category being 3.6% compared to making up only 1.5% of the decrease category ($p = 0.063$). Table 3 indicates that there is an overall decrease in visitation patterns for Asian recreationists with Asian recreationists representing 2.1% of the sample who increased recreation and 4.2% of the sample who decreased recreation. Yet, both of these trends were not significant at the 0.05 alpha level.

Recreationists were categorized as with or without a college degree. Results indicated recreationists in the increased visitation group were more likely to not have a college degree (57.3%). Additionally, people who increased their visitation during the pandemic were more frequently in the lower and higher income groups while those decreasing their visitation tended to more frequently be in the middle income group. Differences for both demographic characteristics were significant at the 0.05 level.

4.3. Demographic trends after the pandemic

Looking forward, about 36% of recreationists anticipated decreasing their visitation to the NPNF after the pandemic ($n = 593$), 30% anticipated keeping it the same ($n = 501$), and 33% anticipated increasing their visitation ($n = 544$).

Across racial and ethnic groups, we found only modest differences in anticipated recreation patterns post pandemic (Table 7) (see Table 6). African Americans/Blacks were slightly more likely to be in the decrease future visitation group while Whites were slightly less likely to be in the decrease future visitation group.

Recreation visitors to the NPNF who stated they intend to maintain their visitation post pandemic were slightly older than visitors who indicated they were going to change their visitation (Table 8). We did not find any significant differences in anticipated future visitation to the

NPNF across education and income groups (Table 9).

4.4. Differences in motivations, place attachment, and barriers to recreation by changes in visitation during the pandemic and after the pandemic

When looking at the motivations among the three groups, those recreationists who decreased their visitation to NPNF during the pandemic were more likely to be motivated by nature and have a core part of their identity associated with the NPNF (Table 10). Conversely, those recreationists who increased their visitation to the NPNF during the pandemic were more likely to be motivated by adventure and less motivated by nature. Additionally, this group of recreationists that increased their visitation levels were also more likely than others to perceive greater current structural, intrapersonal, and interpersonal barriers to recreation. For example, those recreationists who increased visitation during the pandemic were more likely to rate transportation, conflict with other users, crowding, difficulty in understanding regulations, and safety as more significant barriers to recreating on the NPNF (Table 10). These recreationists were also more likely to rate their health, limited outdoor recreation skills, lack of friends and family, and lack of time due to family and work obligations as more significant barriers than those who decreased visitation during the pandemic.

Looking forward, those recreationists that anticipated increasing their visitation after the pandemic reported greater motivated by nature than other recreationists (Table 11). That pattern is opposite what was found for visitation during the pandemic (Table 10). Those anticipating they would increase visitation after the pandemic were also more frequently motivated by spending time with family & friends, novelty, exercise, and pandemic-related factors. This group also had a stronger association than those planning to decrease visitation with all three dimensions of place attachment. The group anticipating they would decrease visitation after the pandemic found more difficulty in understanding regulations, had a greater lack of personal interest, and limited outdoor skills as barriers to recreating in the NPNFs.

5. Discussion and conclusions

In light of the recent growth in outdoor recreation associated with the pandemic (Ferguson et al., 2022, pp. 1–20; Outdoor Industry Association, 2021; Pröbstl-Haider et al., 2023; Rice et al., 2021; Taff et al., 2021; USDA Forest Service., 2021), this study sought to answer three questions: 1) if the rising outdoor recreation participation on the Pisgah National Forest was isolated to the pandemic period or more indicative of a sustained increase in outdoor recreation participation, 2) what are the demographic and motivational differences between those whose recreation decreased, stayed the same or increased during the pandemic, and 3) if these patterns remain stable one year after the pandemic?

Our results suggest that the increased visitation to the NPNF is likely not just a fad, but instead a continued renaissance in outdoor recreation

Table 3

Pandemic effect on visitation by race and ethnicity: Cross-tabulation and chi-square.

Race and Ethnicity Categories	Total		Decrease Pandemic Visitation		Same Pandemic Visitation		Increase Pandemic Visitation		χ^2	p
	n	%	n	%	n	%	n	%		
African American/Black ^b	395	24	108	20	94	23	193	29	14.7	.001
American Indian/Alaskan Native	42	3	8	2	10	2	24	4	5.5	.063
Asian	54	3	23	4	17	4	14	2	5.2	.075
Hispanic or Latinx	164	10	49	9	41	10	74	11	1.7	.789
Native Hawaiian or other Pacific Islander	16	1	5	1	6	1	5	1	1.3	.521
White ^a	1160	71	413	75	299	72	448	67	10.0	.007

Recreationists who reported increasing their visitation during the pandemic were significantly younger ($\bar{X} = 34$ years) than those reporting a decrease in their decrease visitation ($\bar{X} = 38$ years), but not significantly different from those who did not change their visitation ($\bar{X} = 39$ years) (Table 4).

^a Significant at the 0.05 level.

^b Significant at the 0.01 level.

^c Significance at the 0.001 level.

Table 4

Age of NPNF recreationists during the pandemic: One-way ANOVA and bonferroni.

Demographic Variables	Overall (n = 1638)		Decrease Pandemic Visitation ^a (N = 550)		Same Pandemic Visitation ^b (N = 418)		Increase Pandemic Visitation ^c (N = 670)		F	p
	M	SD	M	SD	M	SD	M	SD		
Age (years)	36.8	14.9	38.0 ^c	15.6	39.4 ^c	15.6	34.2 ^{a,b}	13.3	18.513	<.001

*Bonferroni post-hoc test with letter^{a,b,c}.

Signifying a significant difference at the 0.05 level between that mean and respective column.

Table 5

Pandemic effect on visitation by Ses variables during the pandemic: Cross-tabulation and chi-square.

	Total		Decrease Pandemic Visitation		Same Pandemic Visitation		Increase Pandemic Visitation		x ²	p
	n	%	n	%	n	%	n	%		
Education Level*									7.035	.030
No College Degree	952	58	303	55	265	63	384	57		
College Degree	686	42	247	45	153	37	286	43		
Income*									10.629	.031
Lower (>\$25 k-49 k)	723	44	236	43	186	45	301	45		
Middle (\$50 k-149 k)	705	43	260	47	177	42	268	40		
Upper (\$150 k+)	210	13	54	10	55	13	101	15		

* Significant at the 0.05 level.

Table 6

Percent of Respondents who Anticipated Visitation to Decrease, Stay the Same, or Increase.

	N	%	Mean Change in Trips	SD	Median Change in Trips
Decreased Visitation	593	36.2	-3.6	9.1	-2.0
No Change	501	30.2	0.0	0.0	0.0
Increased Visitation	544	33.2	4.9	13.8	2.0

that is beginning to plateau mirroring what is happening nationwide (Ferguson et al., 2022, pp. 1–20; Landry et al., 2021; Outdoor Industry Association, 2021; Rice et al., 2021; Taff et al., 2021; USDA Forest Service., 2021) and around the world (Pröbstl-Haider et al., 2023). While our results show that 36% of respondents anticipate decreasing their visitation to the NPNF with mean drops of 3.5 visits per a year, the 33% that plan to increase their recreation after the pandemic off-set and

exceeded these reductions with a mean increase of 4.9 trips per a year accounting for the anticipated continued high levels of visitation. With that said, the demographic and motivational trends that emerged during the pandemic do not appear to withstand after the pandemic. For instance, recreationists of the increased visitation group during the pandemic were likely to be ethnically more diverse, younger than recreationists of the decrease group, have a lower level of education and income, and be less motivated by nature evident of more non-traditional users recreating on the NPNF during the pandemic. Yet, when looking at demographics and motivations for recreating after the pandemic, recreationists who plan to recreate more appear to be ethnically less diverse. Along these same lines, motivations follow a similar trend. During the pandemic, recreationists more motivated by nature were more likely to be in the group with decreased levels of visitation, whilst those more motivated by adventure were more likely to be in the group with increased recreation. Furthermore, those decreasing visitation during the pandemic had higher levels of place identity associated with the NPNF than did those that made up the increase group, which was surprising. Then, after the pandemic these trends flipped. Recreationists

Table 7

After pandemic effect on visitation by race and ethnicity: Cross-tabulation and chi-square.

	Total		Post-Pandemic Decrease		Post-Pandemic Stay the Same		Post-Pandemic Increase		x ²	p
	n	%	n	%	n	%	n	%		
African American/Black ^a	395	24	168	28	108	22	119	22	9.042	.011
American Indian/Alaskan Native	42	3	20	3	11	2	11	2	2.46	.292
Asian	54	3	16	3	17	3	21	4	1.22	.543
Hispanic or Latinx	164	10	63	11	44	9	57	11	2.78	.595
Native Hawaiian or other Pacific Islander	16	1	4	1	4	1	8	2	2.10	.351
White ^a	1160	71	396	67	367	73	397	73	7.35	.025

^a Significant at the 0.05 level.**Table 8**

Age of NPNF recreationists after the pandemic: One-way ANOVA and bonferroni.

Demographic Variables	Total (N = 1638)		Decrease Pandemic Visitation ^a (N = 593)		Same Pandemic Visitation ^b (N = 501)		Increase Pandemic Visitation ^c (N = 544)		F	p
	M	SD	M	SD	M	SD	M	SD		
Age (years)	36.8	14.9	35.6 ^b	14.4	39.4 ^{a,c}	15.6	35.8 ^b	14.5	11.00	<.001

*Bonferroni post-hoc test with letter^{a,b,c}.

Signifying a significant difference at the 0.05 level between that mean and respective column.

Table 9

Pandemic effect on visitation by Ses variables after the pandemic: Cross-tabulation and chi-square.

	Total		Decrease		Stay the Same		Increase		χ^2	p
	n	%	n	%	n	%	n	%		
Education Level									3.579	.167
No College Degree	952	58	347	59	305	61	300	55		
College Degree	686	42	246	41	196	39	244	45		
Income									6.592	.159
>\$25 k-49 k	723	44	282	48	223	45	218	40		
\$50 k-149 k	705	43	238	40	216	43	251	46		
\$150 k+	210	13	73	12	62	12	75	14		

Table 10

Differences in motivations, place attachment, barriers to recreation, and satisfaction by changes in visitation during the pandemic.

	Total N = 1638		Decrease Pandemic Visitation ^a N = 550		Same Pandemic Visitation ^b N = 418		Increased Pandemic Visitation ^c N = 670		F Statistic	P Value
	M	SD	M	SD	M	SD	M	SD		
<i>Motivations</i>										
Nature	4.04	0.90	4.16 ^c	0.84	4.03	0.90	3.95 ^a	0.95	7.99	<.001
Family & Friends	3.81	0.91	3.84	0.90	3.83	0.90	3.78	0.92	6.50	.522
Novelty	3.92	0.95	3.94	0.95	3.84	1.00	3.95	0.92	1.90	.150
Exercise	3.73	0.99	3.72	1.01	3.66	1.07	3.78	0.93	1.87	.154
Nostalgia	3.66	1.08	3.68	1.08	3.66	1.13	3.65	1.05	.099	.906
Pandemic Related	3.64	0.99	3.70	0.99	3.58	1.03	3.63	0.97	1.42	.242
Solitude	3.42	1.10	3.37	1.08	3.41	1.15	3.47	1.08	1.128	.324
Adventure	3.60	1.08	3.60	1.11	3.49 ^c	1.13	3.67 ^b	1.011	3.42	.033
<i>Place Attachment</i>										
Place Identity	3.70	0.94	3.81 ^{b,c}	0.95	3.63 ^a	0.92	3.64 ^a	0.93	6.52	.002
Place Dependence	3.51	0.98	3.55	0.97	3.48	0.99	3.51	0.98	.67	.513
Nature Bonding	3.76	0.91	3.83	0.92	3.71	0.89	3.73	0.92	2.39	.092
<i>Barriers</i>										
<i>Structural</i>										
Costs of Gas	3.14	1.13	3.19	1.31	3.06	1.36	3.14	1.29	1.07	.344
Lack of Time Due to Work Obligations	2.85	1.41	2.71 ^c	1.40	2.85	1.46	2.97 ^a	1.37	4.98	.007
Distance of NPNF From my Home	2.84	1.30	2.81	1.27	2.75	1.31	2.92	1.32	2.23	.101
Lack of Time Due to Family Obligations	2.68	1.33	2.54 ^c	1.31	2.67	1.31	2.81 ^a	1.35	6.26	.002
Lack of Transportation	2.27	1.33	2.14 ^c	1.27	2.18	1.34	2.43 ^a	1.35	8.66	<.001
Difficulty in Understanding Regulations	2.20	1.26	1.99 ^c	1.17	2.12 ^c	1.22	2.43 ^{a,b}	1.32	20.86	<.001
Lack of Information About Recreating in NPNF	2.21	1.25	2.04 ^c	1.16	2.21	1.23	2.34 ^a	1.29	8.86	<.001
<i>Interpersonal</i>										
Crowding Within the Nantahala-Pisgah NF	2.60	1.24	2.52 ^c	1.17	2.47 ^c	1.24	2.75 ^{a,b}	1.29	8.49	<.001
Lack of Friends/Family to go with	2.39	1.27	2.28 ^c	1.24	2.34	1.25	2.50 ^a	1.30	4.68	.009
Conflict with Other Forest Users	2.14	1.25	1.96 ^c	1.16	2.07 ^c	1.24	2.34 ^{a,b}	1.29	15.25	<.001
<i>Intrapersonal</i>										
Feeling Unsafe in the Forest	2.35	1.32	2.17 ^c	1.25	2.28 ^c	1.29	2.54 ^{a,b}	1.36	12.84	<.001
My Health	2.39	1.33	2.25 ^c	1.30	2.41	1.32	2.50 ^a	1.36	5.00	.007
My Limited Outdoor Recreation Skills	2.33	1.26	2.11 ^{b,c}	1.20	2.32 ^{a,c}	1.24	2.52 ^{a,b}	1.31	16.31	<.001
Lack of Personal Interest	2.17	1.27	1.90 ^{b,c}	1.15	2.16 ^{a,c}	1.27	2.40 ^{a,b}	1.33	23.89	<.001

^{abc}Bonferroni post-hoc test with letter^{a,b,c} signifying a significant difference at the 0.05 level between visitation categories (^a = Decrease, ^b = Stay the Same, and ^c = Increase).

*All questions asked on a 1–5 Likert Scale.

more motivated by nature with a great attachment to the NPNF were more likely to be in the group anticipating they would increase their visitation. These recreationists were also more motivated by friends & family, novelty, exercise, and pandemic-related motivators and associated higher place attachment in all three dimensions than compared to those anticipating they would decrease visitation. These findings suggest that these new emerging recreationists who tend to be more ethnically diverse were recreating more in the NPNF during the pandemic as compared to after the pandemic. Whereas the typical outdoor recreationist, motivated by nature and with high place attachment, anticipate increasing their visitation levels after the pandemic.

Recreationists were also asked to evaluate their current structural, interpersonal, and intrapersonal barriers to visiting the NPNF. Interestingly, those with greater perceived barriers to outdoor recreation were more likely to be in the group increasing (rather than decreasing) their visitation during the pandemic. At first glance, these results seem

counterintuitive as one would think that those most connected to nature and the least constrained would recreate more. This apparent contradiction could be explained by the fact that during the pandemic, other work and life obligations that required time commitments or travel were reduced (Rice et al., 2021). Fewer other obligations combined with the increased reliance on remote work for many during the pandemic may have encouraged this non-traditional recreationist to increase their visitation to the NPNF during the pandemic. Speculation could be that those that experimented with outdoor recreation during the pandemic are too busy and have lost an overall interest in outdoor recreation at FS sites due to increased barriers as life has begun to return to normal or are choosing to recreate elsewhere due to difficulty understanding FS regulations.

Looking forward, as life begins to resume with more normal schedules and obligations, it seems reasonable that recreationists who have greater perceived structural barriers to recreation responded that their

Table 11

Differences in motivations, place attachment, barriers to recreation, and satisfaction by changes in visitation after the pandemic.

	Total N = 1638		Decreased Future Visitation ^a N = 593		Same Future Visitation ^b N = 501		Increased Future Visitation ^c N = 544		F Statistic	P Value
	M	SD	M	SD	M	SD	M	SD		
<i>Motivation</i>										
Nature	4.04	0.90	3.94 ^c	0.93	4.03 ^c	0.91	4.17 ^{a,b}	0.85	9.40	<.001
Family & Friends	3.81	0.91	3.73	0.92	3.82	0.91	3.89	0.89	4.65	.10
Novelty	3.92	0.95	3.87 ^c	0.93	3.84 ^c	1.01	4.04 ^{a,b}	0.90	7.36	<.001
Exercise	3.73	0.99	3.67 ^c	1.00	3.65 ^c	1.05	3.87 ^{a,b}	0.91	8.42	<.001
Nostalgia	3.66	1.08	3.62	1.07	3.65	1.11	3.72	1.06	1.35	.259
Pandemic Related	3.64	0.99	3.55 ^c	1.00	3.62	1.01	3.76 ^a	0.95	6.62	.001
Solitude	3.42	1.10	3.40	1.12	3.38	1.11	3.47	1.06	1.02	.362
Adventure	3.60	1.08	3.54	1.06	3.53	1.12	3.73	1.04	6.15	.002
<i>Place Attachment</i>										
Place Identity	3.70	0.94	3.60 ^c	0.93	3.64 ^c	0.95	3.85 ^{a,b}	0.91	10.98	<.001
Place Dependence	3.51	0.98	3.43 ^c	.95	3.46 ^c	1.03	3.65 ^{a,b}	0.94	8.68	<.001
Nature Bonding	3.76	0.91	3.66 ^c	0.91	3.75	0.90	3.88 ^a	0.91	8.57	<.001
<i>Barriers</i>										
<i>Structural</i>										
Costs of Gas	3.14	1.32	3.14	1.27	3.12	1.33	3.15	1.36	.062	.939
Lack of Time Due to Work Obligations	2.85	1.41	2.88	1.42	2.81	1.38	2.86	1.41	.33	.72
Distance of NPNF from my Home	2.84	1.28	2.85	1.32	2.82	1.30	2.84	1.28	.085	.918
Lack of Time Due to Family Obligations	2.68	1.30	2.71	1.36	2.71	1.31	2.63	1.31	.751	.472
Lack of Transportation	2.27	1.33	2.31	1.33	2.21	1.33	2.28	1.32	.80	.448
Difficulty in Understanding Regulations	2.20	1.26	2.34 ^{b,c}	1.28	2.10 ^a	1.20	2.14 ^a	1.27	5.97	.003
Lack of Information About Recreating in NPNF	2.21	1.25	2.28	1.27	2.2	1.27	2.14	1.21	1.64	.195
<i>Interpersonal</i>										
Crowding Within the Nantahala-Pisgah NF	2.60	1.24	2.72 ^b	1.27	2.48 ^a	1.22	2.59	1.22	4.98	.007
Lack of Friends/Family to go with	2.39	1.27	2.43	1.27	2.34	1.29	2.38	1.26	.671	.511
Conflict with Other Forest Users	2.14	1.25	2.23	1.25	2.09	1.25	2.09	1.23	2.55	.078
<i>Intrapersonal</i>										
Feeling Unsafe in the Forest	2.35	1.32	2.45	1.35	2.27	1.31	2.33	1.29	2.74	.065
My Health	2.39	1.33	2.48	1.34	2.36	1.32	2.34	1.34	1.83	.161
My Limited Outdoor Recreation Skills	2.33	1.26	2.43 ^c	1.31	2.33	1.21	2.23 ^a	1.26	3.63	.027
Lack of Personal Interest	2.17	1.27	2.28 ^c	1.31	2.16	1.27	2.05 ^{1a}	1.23	4.83	.008

Abc Bonferroni post-hoc test with letter^{a,b,c} signifying a significant difference at the 0.05 level between visitation categories (^a = Decrease, ^b = Stay the Same, and ^c = Increase).

**All questions asked on a 1–5 Likert Scale.

visitation to NPNF was likely to decrease. For those recreationists most motivated by nature and connected to Pisgah they may have reduced visitation during the pandemic because they perceived less potential connection to nature or place because of crowds or the potential for interaction with recreationists who didn't share their motivations. They also could have been influenced by fears of traveling or other factors during the pandemic not covered in our survey.

5.1. Implications

For managers within state and federal agencies who have a public mandate to manage their lands for outdoor recreation, these findings suggest that increased visitation levels are here to stay. In order to maintain the quality of the forest system, managers should prepare for continued high levels of visitation to the national forests and other state and federal lands. With more people recreating across the landscape, crowding, littering, and other human-related impacts can affect the quality of the forests and so there needs to be action taken to mitigate the negative consequences of this increased visitation. It is also likely that there will be coping behaviors to adapt to recreational conflict as there a good portion of those who were first introduced to outdoor recreation during the pandemic will continue on with their new habits at the beginner level (Manning & Valliere, 2001). It is suggested that future research conduct longitudinal studies that monitor visitor satisfaction across public outdoor recreation opportunities to understand how this visitation growth is affecting the user experience.

Results also suggest that the pandemic provided users with more diverse backgrounds the space and time to recreate during the pandemic. Unfortunately, it appears that the challenges of everyday life may limit this group from continuing to recreate at the level they did

during the pandemic. This implication provides a challenge to managers who seek social and environmental justice with the provisioning of outdoor recreation (Armstrong & Greene, 2022; Floyd & Johnson, 2002; Rigolon, Fernandez, Harris, & Stewart, 2022). Managers should take advantage of this opportunity while it still exists and try to understand these more diverse users and their perceptions of the quality of the experience provided during the pandemic and see if their anticipated decreases in recreation are associated with any systematic problems that the Forest Service can overcome or if their anticipated decrease in recreation is more associated with structural barriers that public land managers cannot easily solve.

For academics, this study provides another nuanced perspective on outdoor recreation during the pandemic. While it shares some similarities to previous studies showing the growth in outdoor recreation during the pandemic (Csomós et al., 2023; Ferguson, 2022; Power et al., 2023; Rice et al., 2021; Taff et al., 2021), it expands the literature by comparing pandemic trends to future trends. This study also provides some contradictory findings that are worth discussing. As previously mentioned, results indicate the recreationists increasing their visitation during the pandemic were younger, ethnically more diverse, and motivated less by nature compared to recreationists that decreased their visitation to the NPNF. These findings go against both Larson et al. and Taff's et al. findings. Both studies found less ethnically diverse groups using outdoor spaces more during the pandemic as compared to pre-pandemic. In Larson's study, they focused on urban parks during the early stages of the pandemic (i.e., August 2020). It could be speculated that in those early months, the uncertainty of COVID severely affected how people were recreating due to fear. As for Taff's study, it was a nationwide study and generalizable to all "nature-based environments." This study focused specifically on national forest land and so our sample

included only those who chose to recreate on public land from North Carolina, South Carolina, and Georgia. Our study adds to the literature because arguably how one recreates on public lands differs from how one recreates in more urban settings. By focusing solely on National forests, this study provides a deeper understanding of the effects of the pandemic on how people are using public lands to meet their recreation needs. Additionally, unlike the previous studies, this study goes a step further to look at how these trends are evolving as the pandemic reaches its end in affecting daily life. Though in the grand scheme of things, the pandemic is a blimp in time, this study showed how when barriers were removed from the daily life of individuals, a new group of recreationists emerged that was atypical to what previous literature defined as the outdoor recreationists.

5.2. Limitations and future research

While this study extends the outdoor recreation literature by answering two main questions pertaining to outdoor recreation's future visitations levels and the demographic and motivations characteristics of those recreating during the pandemic and moving forward within the US, there are limitations worth noting. One limitation is that the year 2020 was not included in the data collection. This approach was due to the timing of when the survey was released in July and August 2022. The researchers chose to ask recreationists to recall their outdoor recreation behavior from when the survey was released (July and August 2022) to one year back. By keeping the time frame to within one year, the researchers felt this would bring the most accurate responses. With that said, though 2020 was not included, it is predicted that the findings would remain similar except more amplified as there are indications from other studies (Ferguson, 2022; Outdoor Industry Association, 2021; USDA Forest Service, 2021) that the summer of 2020 had an amplified peak. One way to overcome this limitation is for future outdoor research to harness the big data actively or passively generated by outdoor recreationist through their social media accounts, cellular data, or Aps such as Strava (Pellicer-Chenoll et al., 2023; Venter et al., 2023; White et al., 2022). Novel data, such as that from social media, online recreation boards, or mobile devices have shown promise in "looking back in time" (e.g., White et al., 2022) and those approaches may be useful in future research that examines unexpected visitation changes. Another limitation is that only recreationists who visited the NPNF between March 2020 and June 2022 were included in the sample limiting those who completely stopped recreating during the pandemic from being included in the sample. While it was important to ensure our respondents had recent outdoor recreation experience in the NPNF, future research may want to look at those recreationists who completely stopped recreating during the pandemic due to health concerns. Another limitation of this study was that the sample was limited to residents of Georgia, North Carolina, and South Carolina and the questions were focused on the Nantahala-Pisgah National Forest system. This limitation reduces the generalizability of the findings to national and international levels. It is suggested that future research either extend these methods to different regions of the US or use secondary data to confirm if our findings of more diverse recreationists during the pandemic hold across different public lands and forest systems. Lastly, this study's quantitative nature does not allow for rich explanations as to why more diverse users increased their recreation on the NPNF during the pandemic and why they plan to decrease it going forward. It is suggested that qualitative research dive deep into the answers to why this trend emerged.

5.3. Conclusions

With the COVID-19 Pandemic's influence on outdoor recreation around the world well documented (Csomós et al., 2023; Ferguson, 2022; Power et al., 2023; Pröbstl-Haider et al., 2023; Rice et al., 2021; Taff et al., 2021), this study sought to look forward to see if the rising levels of outdoor recreation across US National Forests were solely a

result of the pandemic or more indicative of a renaissance, and answer the question surrounding who were the visitors during the pandemic and if the demographic and motivational characteristics of this group will remain stable one year after the pandemic. This research points to the likelihood that the growing interest to participate in outdoor recreation is here to stay. Thus, managers of outdoor recreation sites should be prepared for high levels of visitation and identify where to invest in user experience and quality control as growth continues. Results also suggest that the pandemic provided a moment in time where the recreational barriers that often hinder younger, less affluent and more ethnically diverse recreationists were removed resulting in increased outdoor recreation among these often-underrepresented groups. However, our result suggests this trend fades a little as the barriers of life return. Recreation managers who seek social and environmental justice with the provision of outdoor recreation can use these findings to see the pandemic as a special moment in time where the barriers of life were removed for many targeted user groups, which helped facilitate outdoor recreation. More qualitative research consisting of focus groups and interviews is needed to understand these underrepresented recreationists and obtain a deeper understanding of how they recreate and if any systematic barriers can be mitigated to better serve these recreationists and make outdoor recreation more just for everyone.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jort.2023.100700>.

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