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Research Paper

User fees displace low-income outdoor recreationists

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ABSTRACT

The arguments for, or against, the use of user fees at outdoor recreation settings are often based upon philosophical, moral, and ethical grounds. Empirically-grounded research on the debate has been sparse. In this study, we report on a unique natural experiment comparing the incomes of individuals visiting very similar outdoor recreation settings which differ only in their requirement of a marginal user fee. Our comparison of the incomes of outdoor recreationists using the settings requiring a fee versus those that do not suggest user fees do play an important role in how low-income individuals choose outdoor recreation settings. Low-income outdoor recreationists tended to choose non-fee settings when they are available and if they support similar activities and opportunities as settings which require a fee. Low-income outdoor recreationists' aversion of settings which require a fee is not a product of their inability to pay the fee, but rather a product of their unwillingness to pay the fee. Low-income outdoor recreationists reported traveling over three times as far to reach non-fee settings relative to comparable settings which require a fee. If user fees are being considered as a visitor management tool, land-use and outdoor recreation planners should not only expect a shift in the socioeconomic composition of visitors to the areas where the fee will be enforced, they should also anticipate displacement and increased use at nearby non-fee settings. Recreation managers should avoid requiring fees at all outdoor recreation settings within an area to ensure displacement does not become exclusion.

1. Introduction

Few, if any, issues related to the management of outdoor recreation on public lands are as controversial as user fees. These fees are created by land management agencies to either generate revenue for the agency, which is most commonly used to fund labor and maintenance-related costs, or in rare cases to restrict use (Manning, 2011). The controversy surrounding user fees has been a persistent point of focus for the land-use planning and outdoor recreation research communities.

Some academics as well as land-use and outdoor recreation planners advocate for user fees for a variety of reasons: User fees allow public land management agencies to be more self-sufficient and less-dependent upon erratic and unpredictable appropriations from federal, state, or local governing bodies (Fretwell, 2000; LaPage, 1994; More, 1998); user fees provide a much needed stream of revenue to fund agencies' large deferred maintenance backlogs (General Accounting Office, 1998); and lastly user fees provide an indirect, yet efficient, way to restrict use to an area, limiting the environmental impacts associated with rising visitation levels (Hammitt, Cole, & Monz, 2015; Manning & Baker, 1981; Stankey & Baden, 1977).

Other academics as well as land-use and outdoor recreation planners believe the benefits associated with user fees are irrelevant because: User fees are antithetical to public land management agencies' mandates to provide outdoor recreation opportunities to all members of the public and not just those who can afford it (Fix & Vaske, 2007); because user fees require the public to 'pay twice' for one service (i.e., the fee and the portion of their federal, state, or local taxes that go to public lands management) (Crompton & Lamb, 1986).

The controversy surrounding user fees arises because many of the arguments for, or against, user fees are true. User fees allow outdoor recreation managers to generate revenue, fund local maintenance and improvement projects, and reduce environmental damage. In many contexts, such as on federally-managed public lands, user fees require outdoor recreationists to pay for a service that they are obligated to receive as part of their rights as a citizen. It is unclear whether the final argument, whether or not fees are discriminatory, is true. Scholarship focused on this question has been limited to findings that are correlational (as opposed to causational) (Taylor, Vaske, Shelby, Donnelly, & Browne-Nunez, 2002) or based on hypothetical scenarios presented to individuals via mail or online surveys (More & Stevens, 2000; Reiling, Cheng, & Trott, 1992; Reiling, McCarville, & White, 1994). Only three studies have used observational data of actual

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Table 1
Previous studies examining whether or not user fees discriminate against low-income individuals.

Type of method	Specific method	Reference	Managing agency	Outdoor recreational activity	Finding
Revealed behavioral responses to fees	On-site experiment combined with a survey administered both on-site and via mail	Manning et al. (1984)	Vermont State Parks	Overnight-use visitors	Lower income recreationists were more likely to report the amount of an overnight-use fee was an important factor influencing their campsite selection. After assigning campsites differential fee levels,[a] the authors found no significant differences between the campsites chosen by lower income individuals when compared to higher income individuals.
	On-site experiment combined with a survey administered both on-site and via mail	Bamford et al. (1988)	Vermont State Parks	Overnight-use visitors	Lower income recreationists were significantly less likely to pay for 'prime' campsites when compared to wealthier recreationists.[a]
	Mail survey	Leuschner et al. (1987)	USDA Forest Service, Linville Gorge Wilderness Area in the Pisgah National Forest; Privately-owned Grandfather Mountain[b]	Day- and overnight-use visitors	The incomes of visitors to Linville Gorge Wilderness Area, which did not charge user fees, were not statistically different than the incomes of visitors to Grandfather Mountain, which charged a $2.50 per person day-use fee and a $5.00 per person overnight-use fee.[c,d]
Simulated behavioral responses to fees	Intercept and telephone survey	Kim et al. (2007)	Recreational fishing sites throughout the southeastern US (Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina)	Recreational fishers	The implementation of a user fee would affect the behavior of low-income anglers more than that of high-income anglers. The welfare cost of a user fee would be greater in absolute terms for high-income anglers, but smaller relative to their income when compared to low-income anglers.
	Mail survey	Shonkwiler and Shaw (2003)	Four reservoirs on the Columbia River	All types of reservoir recreationists	Reservoir recreationists were segmented into two regimes using a finite mixture model. Simulated welfare losses due to a $5 user fee were substantially higher for one regime type (Regime II, higher income recreationists) than for the other (Regime I, lower income recreationists).
Stated behavioral responses to fees (not using stated choice methods)	On-site survey	Taylor et al. (2002)	U.S. Fish and Wildlife Service	Not specific to any one activity	Lower income individuals[e] were more likely to change their plans to visit National Wildlife Refuges if fees were put in place
Stated behavioral responses to fees (using stated choice methods)	Mail survey	More and Stevens (2000)	Vermont and New Hampshire state park systems; USDA Forest Service, Green Mountain National Forest and White Mountain National Forest	Not specific to any one activity	Low-income individuals[f] were more sensitive to access fees[g] associated with a series of hypothetical outdoor recreation trips.
	Mail survey	Reiling et al. (1992)	Maine State Parks[h]	Overnight-use visitors	Lower income individuals indicated they would camp for significantly fewer nights than higher income individuals if user fees[i] were to be increased; the differential effect increased as the amount of the hypothetical fee increased.
	On-site survey	Reiling et al. (1994)	U.S. Army Corps of Engineers, six projects (Burnsville, Strom Thurmond, Truman Canyon, and Mendocino)	Day-use site visitors	A larger proportion of low-income users would stop visiting the U.S. Army Corps of Engineers' projects if a fee system were implemented; Users with lower incomes were also more sensitive to the magnitude of proposed fees,[j] suggesting higher fees would displace a higher proportion of users with lower incomes.
Non-behavioral	Telephone survey[k]	Bowker, Cordell, and Johnson (1999)	Not specific to any one agency	Not specific to any one activity	Lower income individuals were significantly less likely to believe fees or a combination of fees and taxes should be used to fund recreation services on public lands.
	On-site survey	Fix and Vaske (2007)	USDA Forest Service, Ashley National Forest	Rafters, anglers, and day-use site visitors	Lower income individuals were significantly less likely to believe that fees at the Flaming Gorge National Recreation Area were acceptable.[l]

[a] The user fees examined in this study were a $4.50 per night fee and a $8.50 per night fee in 1982; these are equivalent to a $11.25 per night fee and a $21.26 per night fee in 2016.
[b] Grandfather Mountain is now part of the North Carolina State Parks system.
[c] A $2.50 per person day-use fee and the $5.00 per person overnight-use fee in 1985, when data for the Leuschner et al. (1987) study was collected, is equivalent to a $5.61 per person day-use fee and a $11.22 per person overnight-use fee in 2016.
[d] The user fees examined in this study were a $2.50 per person day-use fee and the $5.00 per person overnight-use fee in 1985; this is equivalent to a $5.61 per person day-use fee and a $11.22 per person overnight-use fee in 2016.

recreational visits to public lands to empirically test whether or not fees displace certain users (Bamford, Manning, Forcier, & Koenemann, 1988; Leuschner, Cook, Roggenbuck, & Oderwald, 1987; Manning, Callinan, Echelberger, Koenemann, & McEwen, 1984).

The purpose of this research is to compare visitor profiles to a pair of comparable outdoor recreation settings (one with and one without a user fee) to determine if the fee itself can be attributable to different use patterns. Our primary objective is to use observational data to empirically test whether or not user fees displace certain segments of the population from accessing outdoor recreation opportunities and subsequently, from achieving the benefits associated with participation.

2. Related literature

2.1. Approaches to studying the discriminatory nature of user fees

A relatively large body of recreation research has attempted to discern whether or not user fees discriminate against low-income individuals (Manning, 2011). The methods used within this body of literature have varied widely, resulting in findings that differ considerably in their validity. Our review of the literature revealed three distinct research approaches have been used to investigate the discriminatory nature of user fees (Table 1). These approaches are:

1) Studies using data on outdoor recreationists' revealed behavioral responses to the creation of new and/or increased fees;
2) Studies using data on outdoor recreationists' stated behavioral responses to the creation of new and/or increased fees; and
3) Studies that are non-behavioral (i.e., they ascertain individuals' perceptions of fees as opposed to their behavioral responses to new and/or increased fees).
4) We review research using either the first or second approach here, while listing the research that uses the third approach in Table 1.

The majority of previous empirical research on the discriminatory nature of user fees has used data regarding recreationists' behavioral *intentions* towards *hypothetical* fee programs (More & Stevens, 2000; Reiling et al., 1992, 1994; Taylor et al., 2002). This approach limits validity as behavioral intentions are often poor predictors of actual observed behavior (Ajzen & Driver, 1992; Ajzen & Fishbein, 1980). This fact is especially true for outdoor recreation behavior, where there are almost always a wide variety of uncontrollable and unmeasurable exogenous factors that influence individuals' actual travel behavior (Bockstael, Hanemann, & Kling, 1987; Hunt, 2005; Morey, 1981; Peterson, Anderson, & Lime, 1982).

To generate more valid results, and determine whether or not user fees alone prohibit individuals from visiting outdoor recreation settings, recreation researchers would need to either compare the socio-demographic characteristics of visitors to one setting before and after a user fee was implemented(removed) or compare comparable settings that differ only in their use of a fee.

2.2. Results from studies using data on revealed behavioral responses to the creation of new and/or increased fees

Only three previous studies have either compared the socio-demographic characteristics of visitors to one setting before and after a user fee was implemented (removed) or compared identical settings that differed only in their use of a fee. The lack of previous research using revealed behavioral responses to user fees is most likely because the opportunity to capitalize on a 'natural experiment' does not present itself too often to those who study outdoor recreation behavior (Hilger & Englin, 2009; Kuentzel & Heberlein, 2003).

In the first of these studies, Schwartz and Lin (2006) found that fee increases to 31 U.S. National Parks resulted in significant declines in use. Because Schwartz and Lin's study used aggregated visitation data

[e] The estimated odds of a survey respondent indicating they would change their plans if fees were introduced increased monotonically from 0.070 for those individuals earning between $65,000 and $99,999 to 0.188 for individuals earning under $15,000.
[f] Individuals earning less than $30,000 per year.
[g] The user fees examined in this study were a $1 per person per day fee and a $5 per person per day fee in 1999; these are equivalent to a $1.58 per person per day fee and a $7.92 per person per day fee in 2016.
[h] The Maine State Parks system charges different prices to residents and non-residents. The hypothetical prices presented to respondents in Reiling et al.'s (1992) study were specific to respondents' residency status.
[i] The user fees examined in this study were a $5.00 per site per night fee in 1984; these are equivalent to a $11.61 per site night fee and a $31.36 per site per night fee in 2016, respectively.
[j] The user fees examined in this study were a $1 per vehicle day-use fee and a $5 per vehicle day-use fee in 1993; these are equivalent to a $1.67 per vehicle day-use fee and a $8.35 per vehicle day-use fee in 2016.
[k] 1995 National Survey on Recreation and the Environment.
[l] This relationship was fully mediated by individuals' beliefs about the reasons for, and necessity of, the fee program.

collected for each park (no data on visitors' incomes were collected or available), they were not able to determine if low-income individuals were disproportionately impacted.

In the second study, Manning et al. (Bamford et al., 1988; Manning et al., 1984) experimentally varied the overnight user fees at campgrounds within a series of Vermont State Parks. Their manipulated fees ranged from $4.50 per site per night to $8.50 per site per night. The primary purpose of their study was to determine if a differentiated fee structure could affect visitors' site choice. By administering an additional survey, which visitors filled out either on-site or via mail, Manning et al. were able to determine if there were significant differences between the campsites chosen (and their requisite fees which were paid) by lower income individuals when compared to higher income individuals. The findings of the two analyses Manning et al. published from this study were mixed. Analysis of data collected during pilot testing (Manning et al., 1984) revealed there were no significant differences in the campsites chosen by low, as opposed to high, income individuals. Analysis of the full dataset of over 8100 campsite choices (Bamford et al., 1988) revealed wealthier outdoor recreationists were significantly more likely to choose the higher-priced 'prime' campsites than recreationists with lower incomes. Additionally, when compared to higher income recreationists, lower income campers were significantly less likely to be satisfied with having to pay a fee, more likely to believe the fee charged was too high, more likely to believe fees were unfair, and more likely to say that fees levels played an important role in their campsite choice. Manning et al. conclude by noting land-use planners and outdoor recreation resource managers should "proceed cautiously and only with appropriate research and monitoring" if they are considering implementing a user fee program (1984, p. 339).

In the third study, Leuschner et al. (1987) compared the socio-demographic characteristics of visitors to two comparable outdoor recreation settings in North Carolina. One setting, the Linville Gorge Wilderness Area, is managed by the USDA Forest Service and at the time Leuschner et al. collected their data there was no day-use or overnight-use fee. The other setting, Grandfather Mountain, was privately-owned and managed and charged a $2.50 per person day-use fee and a $5.00 per person overnight-use fee. Leuschner et al.'s survey of 125 visitors to the Linville Gorge Wilderness Area and 173 visitors to Grandfather Mountain revealed the distribution of visitors' incomes was not significantly different between the two areas. Their findings led Leuschner et al. to conclude that "Apparently, fees do not discriminate" (1987, p. 113). Interestingly however, 43% of the respondents from Linville Gorge indicated the fees imposed at Grandfather Mountain had *caused* them to select the free alternative. Leuschner et al. suggest this may have been a strategy to forestall fees being implemented at Linville Gorge. This is a somewhat confounding conclusion given 80% of the respondents from Linville Gorge either "supported" or "strongly supported" fees (1987, p. 107).

In addition to the three studies detailed above, there is a body of research which has used data on recreationists' observed travel behavior to estimate behavioral responses to hypothetical fees. This research, almost exclusively appearing within environmental and resource economics journals, involves estimating the demand for outdoor recreation settings which differ in access costs. Variation in access costs can arise due to variable travel distances (i.e., travel costs) or variable levels of user fees. The inclusion of travel costs or a fee variable in recreation demand models allows economists to easily simulate demand (utility) responses to fee increases or decreases. Within this body of research, very few investigations have explicitly examined differential impacts of hypothetical fees across income levels. This is likely due to the fact the marginal utility of income is assumed to be constant within the random-utility modeling framework (Herriges & Kling, 1999). The small body of research which has allowed the marginal utility of income to vary across a population has consistently found lower income outdoor recreationists to be disproportionally impacted by hypothetical or simulated fees relative to high-income individuals. Specifically, Kim, Shaw, and Woodward (2007) found a fee imposed on fishers in the Gulf of Mexico would affect the behavior of low-income fishers more so than high-income fishers, even though the welfare costs of fees are larger for higher income fishers (higher income fishers recreate more often than low-income fishers). Similarly, Shonkwiler and Shaw (2003) found a $5 increase in user fees for access to the Columbia River would disproportionately impact low-income recreationists.

Due to the mixed results of the three studies grounded in data on outdoor recreationists' actual behaviors and the two simulation-based studies, we are hesitant to hypothesize that user fees in our study area will result in the displacement or exclusion of low-income individuals. To make a more informed hypothesis, we also draw upon the small body of previous empirical research using data on outdoor recreationists' *intended behavioral responses* to the creation of, or increase in, user fees. This research is summarized in Table 1.

2.3. Results from studies using data on stated behavioral responses to the creation of new and/or increased fees

Research investigating the possible discriminatory effects of user fees at publically-managed outdoor recreation areas started in the late 1980s and early 1990s, likely in response to concerns over the U.S.'s increasing federal budget deficits and the new supply-side economic programs advocated for by the Reagan administration (Manning et al., 1984; Reiling et al., 1992). Research focused on the possible discriminatory effects of user fees peaked in the late 1990s, probably in direct response to the passage of legislation within the United States (PL-104-134) which allowed federal land management agencies to increase fees and expand the number of sites that could charge fees (Manning, 2011). We were able to identify three studies explicitly focused on testing whether or not user fees affected the intended recreational behaviors of low-income individuals more than they affected high-income individuals. Each of these studies used data on recreationists' *intended* behavioral responses to *hypothetical* fee structures. Additionally, they all used empirical methods grounded in well-established micro-econometric behavioral theory.

In the first of these studies, Reiling et al. (1992) presented hypothetical user fees to individuals visiting Maine's State Parks, asking the visitors to indicate the number of nights they would stay at a state park if the overnight-use fee were changed and all other physical, social, and managerial characteristics of the park remained unchanged. The hypothetical fee levels ranged from $5 per site per night to $13.50 per site per night. Lower income individuals in Reiling et al.'s study indicated they would camp for significantly fewer nights than higher income individuals if user fees were increased. The differential effect increased as the amount of the hypothetical fee increased (i.e., the lower a recreationists' income was, the more likely they were to indicate an intent to camp fewer nights as user fees increased).

The second of these studies was also conducted by Reiling et al. (1994), however it was focused on the number of day trips individuals would make to recreation areas managed by the U.S. Army Corps of Engineers. Reiling et al. (1994) surveyed over 1400 recreationists who visited one of six different Corps projects in California, Georgia, Missouri, South Carolina, Tennessee, Texas, and West Virginia. Recreationists to these areas were solicited to indicate the number of day-use trips they would take to the recreation area if fees were charged (at the time of the study, all Corps projects did not charge a day-use fee). The hypothetical day-use fees presented to recreationists ranged from $1 to $5 per vehicle. Similar to their study of visitors to Maine's State Parks, Reiling et al. (1994) found low-income users would reduce their use of the Corps' day-use areas more at higher fee levels than would users with higher incomes. Forty percent of all respondents indicated they would not visit a Corps-managed recreation area if a fee (at any amount) were charged; this proportion was significantly higher for recreationists with lower incomes than for those with higher incomes. Reiling et al. (1994) conclude that "low-income users were clearly more sensitive to the

magnitude of the daily fee charged" (1994, p. 18).

The third and final study to use stated behavioral responses to hypothetical user fees ascertained the behavioral responses of New Hampshire and Vermont residents contingent upon the establishment of day-use fees ranging from $1 to $5 at different recreation destinations throughout the region (More & Stevens, 2000). Four hypothetical scenarios were presented to survey respondents; three of the scenarios described recreational trips and the fourth scenario involved not participating in a recreational trip (i.e., staying home). The hypothetical recreational trips described a series of experimentally-varied attributes. These attributes were: destination (a Vermont state park, a site within Vermont's Green Mountain National Forest, and a site within New Hampshire's White Mountain National Forest); amenities (presence of garbage pickup at the campsite, type of toilet facilities); amount of wildlife present; and fees. Respondents were asked to rate the hypothetical trips from 1 to 5, with 5 indicating it was a trip that they would definitely take. More and Stevens (2000) found low-income individuals (those earning less than $30,000 per year in 1999) were significantly more responsive to user fees when compared to high-income individuals (those earning more than $75,000 in 1999). The authors also asked respondents a series of non-behavioral (i.e., attitudinal) questions about user fees and consistently found that low-income individuals were less supportive of fees when compared to high-income individuals. More and Stevens conclude that "it is quite clear that fees have a major discriminatory impact on low-income people" (2000, p. 351).

2.4. Hypothesis

The balance of previous empirical research which has explicitly collected data on individuals' revealed recreation behaviors or their stated behavioral intentions suggests user fees likely *do* prohibit low-income individuals from accessing desired outdoor recreation opportunities (Table 1). Additionally, all previous non-behavioral research suggests individuals with lower incomes believe user fees (or higher user fees) are a less acceptable or appropriate way to fund outdoor recreation management on public lands. This non-behavioral research offers additional tangential support for the discriminatory nature of user fees. However, it is important to note that two behavioral studies comparing similar settings, differing only in either their use of a user fee or the amount of the user fee, have found no evidence of lower income individuals making behavioral changes due solely to the fee (Leuschner et al., 1987; Manning et al., 1984).

Given the majority of previous research suggests fees do prohibit low-income individuals from accessing desired outdoor recreation opportunities, we hypothesize *there will be significantly fewer low-income recreationists visiting the recreational settings in our study area which do charge a fee when compared to those settings with no fee*. If our analysis supports this hypothesis, as expected, we will also test whether non-fee costs (explicitly travel costs) are a limiting factor affecting the decisions of lower income outdoor recreationists. If this is true, and there are no significant differences in the travel costs incurred by low-income recreationists between the sites which impose a fee and those which do not within our study area, we will be more confident in concluding the presence of a fee alone displaced low-income outdoor recreationists.

3. Methods

3.1. Study area

The Central Wasatch Mountains (CWM) are located in the center of northern Utah. These steep mountains climb abruptly from the Salt Lake Valley (1300 m above sea level) and rise to summits over 3350 m. The west side of the CWM fall within Salt Lake County, the most populated county in Utah with over 1.1 million residents and home to Utah's capital, Salt Lake City. On the east side of the CWM is Summit County, home to nearly 40,000 residents and the popular resort town Park City, Utah. The CWM are almost exclusively managed by the Uinta-Wasatch-Cache National Forest's Salt Lake Ranger District; however, there are also a number of private inholdings which range from undeveloped lands to resort developments (e.g., the town of Alta, Utah). The CWM also house six ski resorts: Alta, Brighton, Deer Valley, Park City, Snowbird, and Solitude.

The CWM's main access points and travel corridors are its three main canyons: Millcreek Canyon, Big Cottonwood Canyon, and Little Cottonwood Canyon. The majority of recreation areas along the Wasatch Front and in Big and Little Cottonwood Canyons do not require a fee. Millcreek Canyon does require a nominal fee, which is $3 per day or a $40 annual fee. At the tops of Big and Little Cottonwood Canyons are four of the six ski resorts: Alta, Brighton, Snowbird, and Solitude. Much of the terrain used by these resorts is leased from the USDA Forest Service, so trails and summer access to the majority of the terrain is free, but winter access for skiing/snowboarding requires a lift pass (~$90 per person per day) or a season pass (~$1000 per person per season).

Millcreek, Big, and Little Cottonwood Canyons receive roughly 4.5 million visitors a year (Lamborn & Burr, 2016), and the Park City Resort on the Wasatch Back receives roughly 2 million visitors a year (Personal Communication), which results in the CWM receiving approximately 6.5 million visitors in 2014; this is more than the 6.3 million visitors received by all five of Utah's national parks combined in 2013 (Leaver, 2016). As the results of this study will show, the two most popular recreation activities in the CWM are hiking and skiing, but mountain biking, rock climbing, and backcountry skiing are also popular.

The CWM provide a variety of benefits to surrounding communities in addition to revenue from tourism; these include the health benefits derived from easily accessible outdoor recreation opportunities and a large portion of the freshwater used throughout the region. As the population of Utah grows, so does the demand placed on the CWM's outdoor recreation resources. In response to this demand, specifically concerns over traffic and environmental impacts, the Uinta-Wasatch-Cache National Forest is considering imposing a $6 per vehicle user fee to access areas in the CWM that have always been accessible free of charge (Maffly, 2016).

Because the CWM currently have comparable fee and non-fee areas, they provide a unique opportunity to examine the effects fees have on visitation with data on visitors' revealed recreational behaviors. Through our analysis, we hope to provide some insight into how imposing an additional fee within the CWM may affect the behavior of, and subsequently benefits received by, the populations who currently use the area. In addition, our analysis contributes to the small body of empirical research grounded in data on individuals' revealed recreation behaviors in response to user fees (Table 1).

3.2. Data collection

3.2.1. Sampling design

We collected data via on-site interviews administered to outdoor recreationists using the CWM between May 2014 and May 2015. The survey effort had several broader goals besides trying to determine if user fees displaced low-income outdoor recreationists; these were: 1) to determine the characteristics (e.g., sociodemographic traits, points of origin, etc.) of outdoor recreationists using the CWM; 2) to gain a better understanding of how outdoor recreationists were using the CWM (e.g., activity and site preferences, etc.); and 3) to gain a better understanding of outdoor recreationists' preferences for how the CWM are managed.

To obtain a representative sample of outdoor recreationists, we systematically selected 44 recreation settings throughout the CWM that varied in geographic location and the types of outdoor recreation activities offered (Fig. 1). Our research team had previously administered the on-site surveys for two rounds (2006–2007; 2011–2012) of data collection for the USDA National Forest Services' National Visitor Use

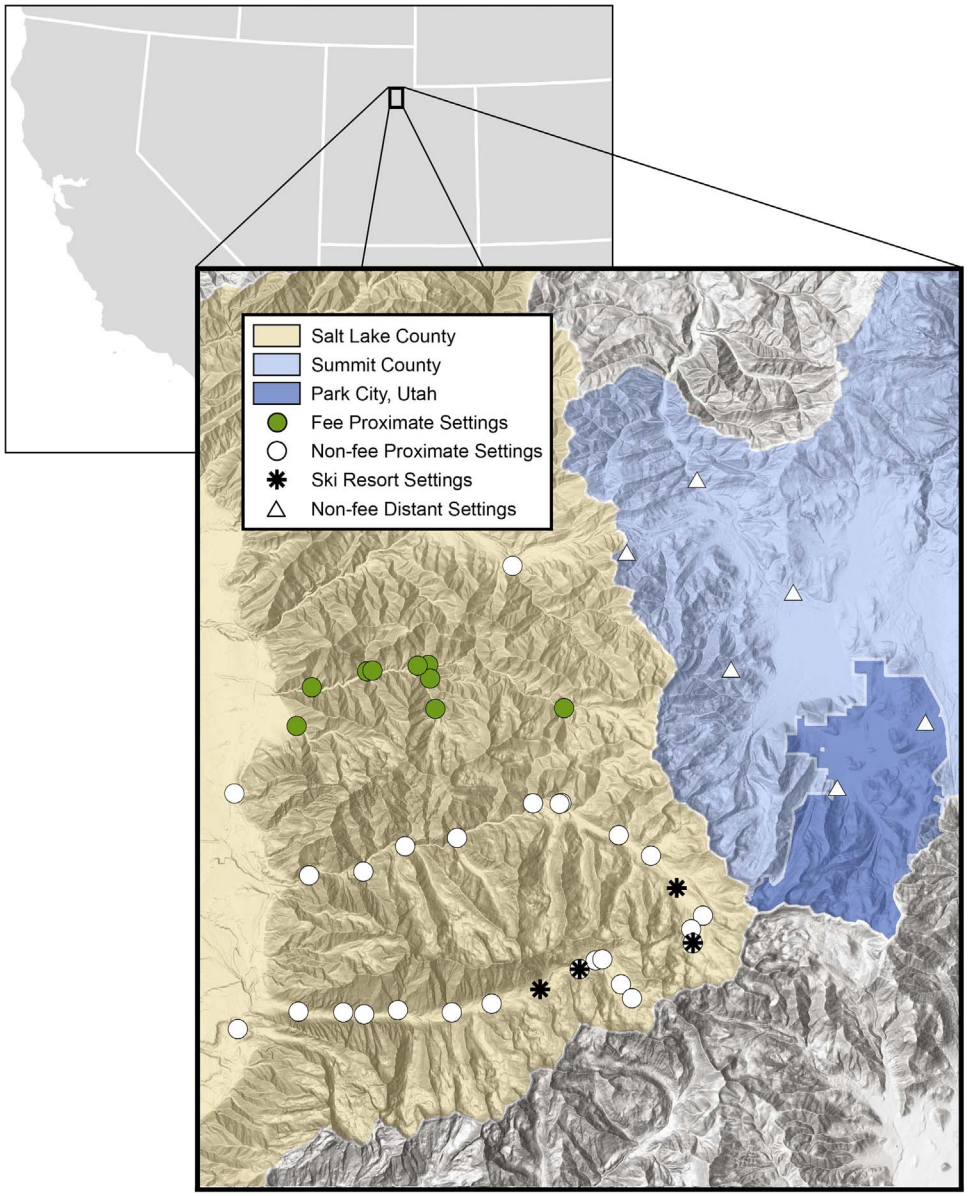

Fig. 1. The Central Wasatch Mountain (CWM) region and the 44 o.

Monitoring program (USDA Forest Service, 2007a, 2007b, 2012). Based on our knowledge of the region's outdoor recreation settings and discussions with outdoor recreation planners and interest groups, we selected settings that would allow us to capture a diverse sample of recreational uses and users. The final selection of settings ranged from Wilderness trailheads to ski resorts. With the 44 recreation settings selected, we developed a random sampling protocol to determine when and where the on-site surveys would be administered. The protocol involved randomly selecting 40 settings and times (alternating between 4-h morning or afternoon blocks) each month for surveying.

3.2.2. Survey administration

We screened outdoor recreationists encountered at the sampled outdoor recreation settings/times for eligibility. Eligible participants had to: 1) be participating in an outdoor recreation activity in the CWM (this was done to intentionally displace visitors who were just driving through the CWM and happened to be intercepted at a trailhead located near a roadside pull-off or rest stop); and 2) be over 18. No incentives were used to recruit participants, and participation in this study was completely voluntary. Eligible participants were contacted as they were leaving the outdoor recreation setting. Amenable contacts were handed a clipboard and survey, and asked to complete it by themselves at their own pace. The survey instrument was 8-pages long and took approximately 10-min to complete. In total, we intercepted 6263 outdoor recreationists over the 12-month period, 4034 of these individuals completed the entire survey; a 64.4% response rate.

3.2.3. Measures

Through the on-site survey, we collected a set of variables related to outdoor recreationists' sociodemographic and trip characteristics. Among the sociodemographic variables was respondents' annual household income. Respondents were given six income categories to choose from: "under $25,000"; "$25,000–$49,999"; "$50,000–$74,999"; "$75,000–$99,999"; "$100,000–$149,999"; and "$150,000 or over." A "Don't know" and a "Refuse" option were also included. The set of sociodemographic variables also included the highest level of formal education respondents had completed; response options included: "Less than a high school degree"; "High school degree or GED"; "Some college"; "2 year technical or associates degree"; "4-year college degree (BA/BS)"; and "Advanced degree (e.g., Master's, JD, MD, DO, Ph.D.)." We also ascertained which racial group respondents most closely identified with; listed groups included: "American Indian/

Table 2
Income distribution of respondents by type of outdoor recreation setting visited.

Income category	Entire sample (all four setting types combined) (n = 3274)	Non-fee proximate (n = 1170)	Fee proximate (n = 755)	Ski resorts (n = 1556)	Non-fee distant (n = 256)
Under $25,000	13%	18%	13%	11%	6%
$25,000 to $49,999	17%	21%	20%	14%	14%
$50,000 to $74,999	16%	16%	20%	14%	13%
$75,000 to $99,999	14%	13%	15%	13%	14%
$100,000 to $149,999	18%	18%	18%	19%	22%
$150,000 or over	21%	14%	16%	29%	31%

Alaska Native"; "Asian"; "Black/African American"; "Native Hawaiian or other Pacific Islander"; and "White." The final sociodemographic data collected related to whether or not respondents consider themselves Hispanic or Latino(a); potential responses were simply "Yes" or "No."

During the survey effort, we also recorded the location where each respondent was intercepted. All 44 survey locations were stratified into one of four areas: Non-fee proximate; Fee proximate; Ski resorts; and Non-fee distant. All four areas are identified and defined below and shown in Fig. 1:

1) **Non-Fee Proximate** – defined as Big Cottonwood Canyon, Little Cottonwood Canyon, and settings along the Wasatch Front where there are no entrance or user fees.
2) **Fee Proximate**– defined as recreation settings only accessible via Millcreek Canyon road, which requires $3 per vehicle per day or $40 per vehicle per year for entrance.
3) **Ski Resorts**– defined as Alta, Brighton, Snowbird, and Solitude ski resorts; these settings were only surveyed during the winter ski season and all respondents had purchased a lift ticket (~$90) or a season pass (~$1000).
4) **Non-Fee Distant**– defined as recreation settings located along the Wasatch Back with no entrance or user fee. We decided to categorize the seven outdoor recreation settings located on the Wasatch Back into their own area type because even though there were no fees associated with these survey locations, they were geographically distinct from non-fee proximate settings. Respondents' socio-demographic characteristics also differed from the characteristics of outdoor recreationists contacted at non-fee proximate settings.

A total of 1427 surveys were completed at the 24 survey settings within the non-fee proximate area, 755 were completed at the 10 settings within the fee proximate area, 1556 were completed at the four ski resorts, and 256 were competed at the seven settings within the non-fee distant area.

The last variable used in this analysis was the distance respondents traveled to reach the setting where they were contacted and asked to complete a survey. Distances were calculated from the centroid of respondents' home ZIP code to the CWM.

3.2.4. Data analysis

We used a chi-square test followed by a contingency table analysis to determine if the income profiles of outdoor recreationists varied between fee and non-fee settings within the CWM. The dependent variable in the chi-square test was annual household income, and the independent variable was the type of area in which respondents completed the survey. The contingency table analysis was used to see how each cell in the six (income levels) by four (area types) bivariate table is related to each other. Following Beasley and Schumacker (1995), an alpha value of 0.05 was used to identify statistically significant relationships between cell-pairs. We used the chi-square test along with the contingency table analysis to assess whether there were significantly fewer low-income recreationists visiting recreational settings that do charge a fee compared to those settings with no fee. We also used an independent-samples t-test to test whether non-fee costs (explicitly travel costs) are a limiting factor affecting the decisions of lower income outdoor recreationists.

4. Results

4.1. Respondent characteristics

The mean age of respondents was 42 years old, 58% of respondents were male, 68.8% had earned at least a four-year bachelor's degree, 95% identified as being White and 2.9% identified as Hispanic/Latino (a). The median annual household income of respondents was between $75,000 and $99,999. The distribution of respondents' annual household incomes was fairly evenly distributed with 13% of respondents reporting having an annual household income under $25,000 (Table 2, Column 2).

Ancillary analyses of the socio-demographic characteristics of the sample revealed they are not representative of the surrounding communities (i.e., Salt Lake County and Park City). When compared to Census data for Salt Lake County (2014b), outdoor recreationists using the CWM are more educated, less racially diverse and have higher annual household incomes than the general population (Table 3). The socio-demographic characteristics of outdoor recreationists using the CWM more closely match Census data from Park City (2014a) in education and income levels (Table 3). However, outdoor recreationists using the CWM are less racially and ethnically diverse than those living in Park City.

4.2. Recreational use and users by area type

To illustrate the similarities between non-fee proximate and fee proximate outdoor recreation settings, and to illustrate the differences between these two types of settings and the ski resorts and non-fee distant settings, we compared the dominant recreational activities that individuals reported participating in during their recreational visit (Table 4).

Table 3
Comparison of the socio-demographic characteristics of outdoor recreationists using the CWM and the adult populations of surrounding communities.

	Outdoor recreationists using the CWM (n = 3306)	Salt Lake County census	Park City census
Bachelor's degree or higher	68.8%	31.3%	60.7%
Individuals identifying their racial/ethnic background as White	95%	72%	71.8%
Individuals identifying their racial/ethnic background as Hispanic/Latino(a)	2.9%	17.8%	24.1%
Median Household Income	$75,000–$99,999	$61,446	$88,438

Table 4
Respondents' main activity/reason for visiting the Central Wasatch Mountains by type of outdoor recreation setting and season.[a]

Type of outdoor recreation setting (by season[a])	Main activity/reason for visiting the Central Wasatch Mountains	Percentage of outdoor recreationists
Non-fee proximate		
Summer	Hiking/walking	68.6
	Rock climbing	9.7
	Mountain biking	4.0
Winter	Hiking/walking	35.2
	Backcountry skiing	31.8
	Snowshoeing	10.5
Fee proximate		
Summer	Hiking/walking	69.9
	Mountain biking	7.2
	Road cycling	6.5
Winter	Hiking/walking	52.0
	Cross-country skiing	17.2
	Walking a pet (or pets)	10.3
Ski resorts		
Winter (only)	Downhill skiing	60.6
	Downhill snowboarding	20.1
	Cross-country skiing	13.0
Non-fee distant		
Summer	Hiking/walking	52.9
	Mountain biking	31.4
	Trail running	9.9
Winter	Hiking/walking	53.5
	Mountain Biking	12.5
	Snowshoeing	10.7

[a] Summer season defined as May 21, 2014 through October 31, 2014, and April 1, 2015 through May 28, 2015; Winter season defined as November 1, 2014 through March 31, 2015.

Settings within both the non-fee proximate area and the fee proximate area are easily accessible to residents living in Salt Lake County, have similar topography and offer many of the same outdoor recreational opportunities. Nearly 70% of outdoor recreationists in both the non-fee proximate (68.6%) and fee proximate (69.9%) areas participate in hiking and walking in the summer. Hiking and walking is also the dominant activity for both of these areas in the winter season (non-fee proximate = 35.2%; fee proximate = 52%). The data also revealed another similarity in dominant activity types between the non-fee proximate and fee proximate areas. Specifically, the third most dominant activity occurring within the non-fee proximate area in the summer was mountain biking (4.0%); it was the second most dominant activity within the fee proximate area over the same time period (7.2%).

We also tested to see if there were socio-demographic differences between outdoor recreationists using non-fee proximate and fee proximate settings. Chi-squared tests revealed no statistically significant differences in respondents' race, ethnicity, and age; however, there were statistically significant differences in annual household income and education. The differences in annual household income between the two settings align with our hypothesis. The difference in education is also not surprising given the positive correlation between education and income. Further analysis of the differences between the income levels across all four types of outdoor recreation settings is presented in the next section.

A large body of empirical research on outdoor recreation behavior suggests individuals with similar outdoor recreation behaviors, attitudes, and preferences will seek out and visit similar types of outdoor recreation settings (Galloway, 2010, 2012; Hopkins & Moore, 199; Hunt, 2008; Lee, Graefe, & Li, 2007; McFarlane, 2004; Merrill & Graefe, 1998; Scott & Thigpen, 2003; Virden & Schreyer, 1988). This, in conjunction with the similarities between the non-fee proximate and fee proximate areas described above, decreases the probability that potential differences in income levels between the two areas can be attributed to either differences in the outdoor recreation activities supported by the settings or differences in the types of outdoor recreation opportunities individuals who use those settings are seeking out.

4.3. Chi-square and contingency table analysis

Results from the chi-square test were statistically significant (χ^2 (15) = 145.33, p < 0.001), indicating annual household incomes are not evenly distributed across the four types of outdoor recreation settings. The phi value of 0.211 indicates a 'medium' effect size, which suggest the finding of statistical significance is not biased by the sample size (Cohen, 1988).

Contingency table analysis is a test of whether or not the number of observations within the table's cells are statistically different than would be expected under a null hypothesis of no relationship between the two variables being compared (Agresti, 2002). Adjusted standardized residuals (ASRs) under the null hypothesis are assumed to have a mean of zero and a standard deviation of 1. Consequently, adjusted standardized residuals greater than 1.96 (2 is used by convention) indicate the observed count within a cell is different than what would be expected under the null hypothesis, at a 0.05 level of significance.

Results from the contingency table analysis performed on the *income × area type* table (Table 5) revealed significantly more low-income recreationists (annual household incomes less than $25,000 per year) were using settings within the non-fee proximate area (*ASR* = 3.9, $p < 0.05$). The analysis also revealed significantly more individuals with household incomes between $25,000 and $49,999 were visiting non-fee proximate settings (*ASR* = 2.4, $p < 0.05$). We did not find a significantly high number of individuals within both of these lower income categories visiting settings within the fee proximate area. These findings suggest outdoor recreationists with lower incomes

Table 5
Chi-square test and contingency table analysis comparing outdoor recreationists' setting choices and their annual household incomes (n = 3274).

Type of outdoor recreation setting	Count of outdoor recreationists (Percentage of outdoor recreationists) *Adjusted standardized residual*							
	Under $25,000	$25,000–$49,999	$50,000–$74,999	$75,000–$99,999	$100,000–$149,999	$150,000 or over	χ^2	Φ
Non-fee proximate	210 (17.9%) 3.9**	240 (20.5%) 2.4**	189 (16.2%) 0.2	156 (13.3%) −0.1	210 (17.9%) −0.4	165 (14.1%) −5.3**	145.33***	0.211
Fee proximate	81 (12.5%) −0.6	127 (19.6%) 1.2	127 (19.6%) 2.2**	94 (14.5%) 0.7	114 (17.6%) −0.5	106 (16.3%) −2.7**		
Ski resorts	135 (10.9%) −2.3**	173 (13.9%) −2.8**	176 (14.2%) −1.4	160 (12.9%) −0.5	233 (18.7%) 0.3	366 (29.4%) 5.9**		
Non-fee distance	13 (6.1%) −2.7**	30 (14.2%) −1.1	28 (13.2%) −0.9	30 (14.2%) 0.3	46 (21.7%) 1.1	65 (30.7%) 2.8**		

df = 15.
** $p < 0.05$.
*** $p < 0.001$.

(< $49,999) are disproportionately visiting settings within the non-fee proximate area, even though very similar outdoor recreation opportunities are offered at settings within the fee proximate area.

The contingency table analysis also revealed significantly fewer outdoor recreationists with incomes below $49,999 were visiting the ski resorts (income < $25,000, $ASR = -2.3$, $p < 0.05$; income between $25,000 and $49,999, $ASR = -2.8$, $p < 0.05$). Additionally, the data revealed significantly more outdoor recreationists with high incomes (> $150,000 per year) were visiting the ski resort settings ($ASR = 5.9$, $p < 0.05$). Both of these findings are expected given the high costs associated with skiing and snowboarding, the two dominant activities supported by the ski resort settings (Table 4).

Our analysis also revealed significantly fewer high-income (> $150,000 per year) outdoor recreationists using either the non-fee proximate ($ASR = -5.3$, $p < 0.05$) or fee proximate settings ($ASR = -2.7$, $p < 0.05$). Significantly more of these high-income individuals were visiting the non-fee distant settings ($ASR = 2.8$, $p < 0.05$). These findings can possibly be explained by two factors. First, the cost of living around the non-fee distant setting is higher than the cost of living near the fee and non-fee proximate settings, which results in there being fewer low-income individuals and many more high-income individuals living adjacent to the non-fee distant settings. Second, outdoor recreationists with higher incomes are more likely to travel further from their homes to engage in outdoor recreation because the associated travel costs are less of a burden. The combination of these two factors result in there being more high-income individuals and fewer low-income individuals in the non-fee distant area even though the activities and opportunities supported by settings in this area are quite similar to those in the non-fee and fee proximate areas (Table 4).

Some scholars have made the argument that lower income individuals are already priced out of participating in outdoor recreation because of travel and equipment costs (Clawson & Knetsch, 1966; Vaux, 1975). Consequently, these scholars contend that fees do not have that big of an overall impact on visitation because individuals who can pay for relatively high travel and equipment costs will not be affected by a marginal user fee. To test this argument, we compared the travel distances (and associated costs) of outdoor recreationists with lower incomes visiting either non-fee proximate or fee proximate settings within our study area. If there is no difference in the distance traveled by these individuals to visit fee and non-fee settings, we will be more confident that the significantly disproportionate cell counts noted above are likely due to the presence of a fee alone. If individuals with lower incomes travel just as far to reach a non-fee setting as they travel to reach a setting that requires a user fee, any difference in the use of those two types of settings is likely attributable to the fee itself. Our results from this comparative analysis are reported in Table 6.

The findings reveal that not only are low-income outdoor recreationists traveling just as far to visit non-fee proximate settings as they are fee proximate settings, they are traveling over three times as far to reach these 'cheaper' alternatives. The average distance traveled by outdoor recreationists with household incomes below $25,000 to reach fee proximate settings was 80.5 km. Individuals with the same income levels were traveling 244.6 km to reach non-fee proximate settings. This difference was statistically significant ($t = 3.19$, $p \leq 0.002$). This finding, in conjunction with the results of the contingency table analysis presented above, suggests *the presence of a fee alone displaces low-income outdoor recreationists*. After imputing average travel cost values following the methods outlined by Smith and Moore (2012) and Smith, Siderelis, andMoore (2010) we were able to discern that low-income outdoor recreationists will incur higher overall costs to participate in outdoor recreation, so long as they do not have to pay a user fee (non-fee proximate travel costs = $184.35, fee proximate travel costs = $60.67). It may not be the ability of the visitor to pay the fee but more of a psychological reaction of avoiding fees if 'free' alternatives are available.

5. Discussion

The debate over whether or not fees should be used by public land management agencies has been a long-standing debate characterized by diverging moral and philosophical opinions as well as mixed scientific results (Table 1). Some scholars have argued outdoor recreation opportunities and benefits are a *right* that all individuals should be able to enjoy, regardless of their income (Dustin, 1986 Harris & Driver, 1987). Voices of opposition against user fees in the press have expressed stronger opinions, calling user fees "the rallying cry of the rich and privileged" (Hershey, 1983).

Previous research focused on determining whether or not fees actually displace or exclude low-income outdoor recreationists from participating has been mixed (Table 1). However, the balance of previous research suggests the presence of user fees does, in fact, result in reduced participation rates among individuals with lower incomes. Reduced participation rates are especially evident among those individuals with very low household incomes (below $25,000 per year) (Bamford et al., 1988; More & Stevens, 2000; Reiling et al., 1992, 1994). Our study sheds new light on this body of scholarship by: 1) providing behavioral evidence that user fees displace low-income individuals from participation; and 2) by suggesting fee-based displacement is likely attributable to low-income individuals not *willing* to pay, as opposed to them not being *able* to pay.

5.1. Behavioral evidence that user fees displace low-income individuals

Our knowledge on the effects of user fees on low-income individuals' outdoor recreation behavior was largely created through studies of individuals' stated behavioral responses to user fees. Research using data on outdoor recreationists' *stated* behavioral responses lacks what social psychologists refer to as mundane realism. Simply put, there is little agreement between how an individual perceives a particular hypothetical scenario described in a survey and how (or even if) they will experience that scenario in their everyday lives (Aronson, Wilson, & Brewer, 1998). Consequently, there is the possibility that individuals' stated behavioral responses to a fee/non-fee scenario will be the product of a different set of decision-making factors (such as social desirability) when that scenario is asked about in a survey relative to when that scenario is actually experienced in the individual's daily life. Only three previous studies have examined the effect of user

Table 6
Comparison of the mean round-trip distance traveled by low-income outdoor recreationists (household incomes < $25,000 per year) visiting non-fee proximate settings and fee proximate settings.

	Type of outdoor recreation setting						95% CI for mean difference		
	Non-fee proximate			Fee proximate					
	Mean	*SD*	*n*	*Mean*	*SD*	*n*		*t*	*df*
Round-trip distance traveled (km)	244.6	638.9	188	80.5	185.1	73	39,165	3.19*	247

* $p \leq 0.002$.

fees on low-income individuals' revealed outdoor recreation behavior. These studies include two by Manning et al. (Bamford et al., 1988; Manning et al., 1984) which found mixed results for any behavioral response amongst low-income outdoor recreationists, and another by Leuschner et al. (1987) which found no evidence of low-income outdoor recreationists being displaced from an area that charged user fees when compared to a similar area with no fees.

In this study, we capitalized on the opportunity to conduct a unique natural experiment comparing the incomes of visitors to two very similar types of outdoor recreation settings, one of which required a nominal user fee ($3 per day or $40 per year) and the other which required no user fees. We illustrated the types of recreational activities and opportunities supported by these outdoor recreation settings were very similar. We also found no statistically significant differences in socio-demographic variables beyond income and education between visitors using fee and non-fee proximate settings. The lack of differences between setting and user characteristics strengthens the argument that fees are attributable to the observed differences in income levels between fee and non-fee areas.

Our results revealed significantly more low-income outdoor recreationists were visiting non-fee proximate settings than expected. This finding suggests either: the presence of a user fee in the fee proximate settings was displacing low-income outdoor recreationists to non-fee proximate settings; or low-income outdoor recreationists were actively seeking out the 'cheaper' alternative outdoor recreation opportunities offered at non-fee proximate settings. While our findings are by no means the definitive word on whether or not user fees displace low-income outdoor recreationists from participation, they do offer some compelling *behavioral* evidence that user fees (even marginal fees) play a critical role in low-income individuals' choice of outdoor recreation settings. The contribution our research makes to the literature is more so through the type of data we used as opposed to the results those data support. More simply put, researchers have believed for quite some time that user fees discriminate against low-income outdoor recreationists, however they have had very little empirical evidence on recreationists' actual behavior to support this belief.

5.2. Fee-based displacement is caused by an unwillingness, as opposed to an inability, to pay the fee

Some scholars have argued that fees do not displace or exclude outdoor recreationists because low-income individuals are already priced out of outdoor recreation due to high travel and equipment costs (Vaux, 1975; Clawson & Kentsch, 1966). There is little doubt that travel and equipment costs do price out some people; however, from our findings, low-income individuals still make up a large proportion of people recreating in the CWM. Thirteen percent of our total sample had an annual household income under $25,000, and assuming the CWM receive approximately 6.5 million visitors a year (Lamborn & Burr, 2016), this means roughly 845,000 of those visits are made by low-income individuals.

Knowing there is still a large proportion of low-income recreationists, the question becomes *how are fees affecting low-income recreationists' decisions on where to recreate?* There was a higher proportion of low-income individuals recreating in non-fee proximate settings than expected, and under further investigation we found low-income individuals were traveling three times the distance to reach the non-fee areas over the areas requiring a user fee. If we look at the costs associated with these travel distances, $184.35 for non-fee proximate and $60.67 for fee proximate, the $3 fee seems relatively insignificant when individuals are incurring *total* costs of over $184.

To help explain this phenomenon, we turned to behavioral economics to see what possible psychological responses to the fee could be taking place. Across a wide range of decision-making situations, ranging from individuals' food choices to the decisions they make about which type of vehicle to drive, behavioral economics research has revealed that individuals are more responsive to options that are presented as having no cost, even when the cost of alternative options might be extremely marginal (on the order of one of two cents) (Shampanier, Mazar, & Ariely, 2007). The behavioral economist Dan Ariely concludes that when it comes to attracting the public's attention and influencing their behavior "the difference between two cents and one cent is small. But the difference between one cent and zero is huge!" (2009, p. 62). When applying this idea to the observed behavioral responses to fees in the CWM, it makes a great deal of sense that people would be allured by the free option even when a $3 fee is relatively insignificant in the scope of costs already accrued from the trip, especially when the fee and non-fee options are nearly identical. Consequently, it seems the factor driving low-income individuals to the non-fee settings is not their *inability* to pay a user fee, but more of a psychological response to the free alternative which creates an *unwillingness* to pay.

Recreation resource management agencies can integrate this knowledge into their ongoing communication and education efforts. Nearly all agencies, including the USDA Forest Service, provide information or educational content intended to persuade visitors to adopt behaviors compatible with management objectives. Information and education efforts tend to be viewed favorably by outdoor recreationists (Roggenbuck, 1992; Vander Stoep & Roggenbuck, 1996). These efforts can also be highly effective at influencing behaviors that occur simply because visitors or potential visitors are uninformed (Guo, Smith, Moore, & Schultz, 2017; Manning, 2011). It is very plausible that many outdoor recreationists may be unaware of the full financial costs associated with their trip choices, including the costs associated with traveling to and from a destination. Neglecting to consider the full financial costs associated with alternative outdoor recreation destinations is more likely for 'local' trips relatively close to recreationists' home (like most recreation settings managed by the USDA Forest Service). If recreation resource management agencies must implement user fees, we recommend that on- and off-site education materials be designed to inform visitors that they may actually be saving money by recreating at a destination requiring a fee that is closer to their home relative to free alternatives further away. Logically, information and education efforts like this (i.e., those focused on the financial costs of participation) would resonate more with lower income individuals who have less discretionary income to devote to outdoor recreation participation.

5.3. Limitations

As with all research, this study does have limitations. First, we were unable to examine whether or not user fees result in compound discriminatory effects for low-income individuals who also identify with a minority racial or ethnic group. This was primarily due to the relatively homogenous population that uses the CWM (95% of outdoor recreationists using the CWM are White). Given this limitation, we re-reviewed the literature on the discriminatory nature of user fees and were unable to identify any empirical data examining compound (i.e., interaction) effects of user fees on low-income minorities. Future research, more explicitly focused on sociodemographic groups that tend to have lower incomes is certainly warranted. This is especially true for racial and ethnic minority groups, given they have higher rates of both adult and childhood obesity relative to their White counterparts (with the exception of Asians) (Ogden, Carroll, Kit, & Flegal, 2014). Future research along these lines would help outdoor recreation managers in urban-proximate settings understand if the user fees they impose disproportionately impact individuals who are both low-income and identify with a minority racial or ethnic group. From this understanding, managers could work to identify solutions that mitigated any discriminatory impact their user-fees may have caused. For example, an agency would be able to develop and implement free programs that meet the interests of specific racial and ethnic minority groups

(Gobster, 2002). Regardless of the compound discriminatory effects fees may have, there is strong evidence to suggest fees do alter the behavior of low-income individuals. Knowing this, outdoor recreation managers and policy makers need to be thoughtful when implementing or increasing fees because they could easily displace a significant proportion of their users. If the goal of managers and policy makers is to provide outdoor recreation opportunities to all members of a society, then it is important to provide settings that are free so lower income people can access outdoor recreation opportunities and receive their many associated benefits.

A second limitation of this work is that we were unable to determine how the actual amount of a user fee affects low-income outdoor recreationists' behavior. All we are able to definitely say is that the $3 per visit user fee within our study area does affect low-income outdoor recreationists' travel behavior. It is possible that higher fees, for example $10 per visit, would also impact the travel behavior of outdoor recreationists with moderate incomes. Future research is needed that explores observed behavioral responses to different amounts of user fees. Such research could enable outdoor recreation managers to develop and implement spatially-variable fee policies that, while still generating revenue for their agency, do not displace or exclude low- or moderate-income outdoor recreationists from certain types of outdoor recreation opportunities.

6. Conclusion

User fees are one of the most contentious and long-standing public land management issues. Historically, the arguments for or against user fees have been based upon philosophical, moral, and ethical grounds. This is largely attributable to the lack of good scientifically-valid evidence capable of suggesting fees either do, or do not, have an impact on how and why individuals on the economic margins of society participate in outdoor recreation. Only a few studies have been grounded in behavioral data collected from outdoor recreationists in a 'real world' environment. The work presented here adds to this small body of literature through a unique natural experiment. Our findings suggest that, yes, user fees do play a critical role in low-income individuals' choice of outdoor recreation settings. Low-income individuals will tend to choose settings without user fees when they are available and support similar outdoor recreation activities and opportunities as those settings which do require a fee. However, our analysis revealed the effect of user fees is more than a question of whether or not low-income outdoor recreationists *can* participate in outdoor recreation, it is also a question of *why* they choose to participate in outdoor recreation at settings without user fees. Our data suggest the presence of a user fee, even a marginal user fee, is a substantial factor contributing to low-income individuals' choice of outdoor recreation settings. Low-income outdoor recreationists will travel significantly further to reach a non-fee setting than to reach a similar setting closer by. While this psychological avoidance is irrational, it may be predictable. If it is predictable, proactive land-use and outdoor recreation policies can account for it. If user fees are being considered as a visitor management tool within certain areas of an outdoor recreation system, land-use and outdoor recreation planners should not only expect a shift in the socioeconomic composition of visitors to the areas where the fee will be enforced, they should also anticipate displacement and increased use at nearby non-fee sites within the same system.

This research suggests user fees do displace low-income outdoor recreationists or exclude them from participation. However this is only half of the story, as our findings also suggest fee-based displacement is caused not by low-income individuals' inability to pay user fees but rather their unwillingness to pay them.

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