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Visitor Willingness to Pay U.S. Forest Service Recreation Fees in New West Rural Mountain Economies

Catherine M. H. Keske[1] and Adam Mayer[2]

Abstract

This study uses a contingent valuation model to evaluate visitors' stated willingness to pay (WTP) for recreation at Colorado "Fourteeners": peaks that rise higher than 14,000 feet. The study also assesses the respondents' self-reported response uncertainty. One scenario queries respondents about a hypothetical situation in which they would pay an entrance fee where 80% of the funds are used on-site, and the degree of certainty with which they answered the question. Like prior articles from this 6-year project (2006-2012), results indicate a high WTP for recreation on Colorado Fourteeners. Results reveal that 62% of respondents are willing to incur an additional fee of $20 or less to recreate at the study site. Regardless of whether or not the respondent is willing to pay an additional fee for recreation, approximately 90% of respondents report a high level of certainty in their stated answers to both the WTP and the fee questions, which could be connected to the recreators' sense of place on Fourteeners. Therefore, recreators exhibit clear preferences and low uncertainty in their WTP for general cost increases and localized access fees. Implications could have a complex effect on when, if, and how fees should be applied in "New West" economies reliant on revenues from recreation.

Introduction

This article uses a contingent valuation model (CVM) to measure visitor willingness to pay (WTP) for hypothetical fee increases at hiking trails located at Colorado "Fourteeners": peaks that rise above 14,000 feet. Prior articles from this 6-year project (2006-2012) show that Fourteener recreators have relatively higher trip expenditures and a larger consumer surplus (i.e., higher stated willingness to spend more money above what they have already paid) at these rural sites compared to other hiking and outdoor recreation experiences (Keske & Loomis, 2007, 2008; Loomis & Keske, 2009). Even the Great Recession of recent years did not show a statistically significant change in visitor expenditures at Fourteeners from 3 years earlier when the economy was bustling (Loomis & Keske, 2012). On the other hand, citing concerns about high visitor use and environmental damage on hiking trails from crowding and overuse, in 2010 the U.S. Forest Service (USFS) proposed a $10 to $20 hiking access fee at a comparable Fourteener location in Colorado (USFS, 2010). This proposed policy yields interesting questions about the feasibility and the socioeconomic impact of the fees on residents of rural mountain communities that are shaping the New West economy. Specifically,

would such a fee deter use and how would the reduction in visitation affect local and regional economies?

Like prior studies, this article includes an analysis of the certainty with which respondents answer questions about their WTP, as measured in consumer surplus. This study adds to the literature by examining whether respondents would pay an entrance fee to use Fourteener sites, and the certainty with which they answer the fee question. In contrast to previously published studies about uncertainty and WTP (Loomis & Ekstrand, 1998; Ma, Lupi, Swinton, & Chen, 2011; Moore, Bishop, Provencher, & Champ, 2010), approximately 90% of respondents in this study reported answering the fee questions with a high degree of certainty. The high degree of certainty (either in support of or against fees/cost increases) was qualitatively validated by comments written on questionnaires. Despite providing relatively definitive opinions,

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analysis revealed no statistically significant relationship between WTP a usage fee of $20 or less and willingness to visit the site for recreation. A small statistically significant difference between restricted and unrestricted logit models was detected, indicating that a model without the "small-fee" variable has higher predictive power. These findings imply that fees and response certainty complicate WTP estimation. Results from this study indicate that the decision to recreate appears to be independent from whether the site has a fee. Quantitative results, combined with unsolicited qualitative feedback written on surveys by respondents, indicate that site visitors have definitive and potentially divisive opinions about policies that increase costs or impose fees at recreation sites. These findings could yield complex implications about when, if, and how to implement fees for recreation on Fourteeners and how those decisions will affect New West economies.

Sense of Place and Fourteener Recreation in Colorado's New West Economy

A New West economy has been depicted as one that is based in recreation (Loomis, 2002), retail, tourism (Kerkvliet, 2008), protection of environmental values (Morris & McBeth, 2003), and an influx of residents desiring high-amenity lifestyles (Inman & McLeod, 2002). This has often been contrasted with the "Old West" economy, characterized by natural resource uses such as extraction and ranching (Power & Barrett, 2001).

Both visitors and residents consider the environmental and natural resource amenities of New West economies desirable. Research suggests that rural areas characterized by natural amenities have experienced population growth at substantially higher rates than nonamenity regions (Johnson, 2001; Johnson & Beale, 1994; McGrannahan, 1999). The migrants to amenity regions are drawn to favorable climates, attractive scenery, and various recreational opportunities, which provide the foundation to drive economic development. Often referred to as amenity migration (Gosnell, 2011), the movement of people based on the draw of natural and/or cultural amenities can be thought of as both a driver and outcome of rural sociodemographic transition. Whereas the natural amenities of an area are a fundamental driver of this migration (Theobald & Romme, 2006), the role of perceptions in creating "rurality" also seems to affect individual decisions to relocate in these amenity-rich regions.

Recent data confirm that the New West recreation and tourism industry is substantial in Colorado, and some inferences may be made about the study region. Most recent results from the annual Longwoods International tourism study estimates that the state attracted 55.1 million visitors in 2010, a 6.1% increase from the prior year and the highest total ever reported. That same year, tourism expenditures totaled $8.8 billion, an increase of 5% from the previous year, although aggregate expenditures are still lower than the previous high of $10.9 billion in 2008 (Longwoods International, 2011). Because more than half the state's population is located in the Denver Metropolitan Area, there is a proclivity for the study region to attract a large number of day trippers.

Research published from 2006 studies by Keske and Loomis (2007) and Loomis and Keske (2009) found considerably higher value, as measured by consumer surplus, for Fourteener recreation compared to typical hiking experiences. The authors also found that consumers demonstrate low substitutability between Fourteener recreation sites and between Fourteeners and Thirteeners: peaks above 13,000 feet (Loomis & Keske, 2009). In the 2009 study, surveys were distributed that essentially replicated the 2006 study to account for changes in WTP that might be because of macroeconomic effects or changes in real income (Loomis & Keske, 2012). In 2009, "control" surveys were redistributed at one peak to assess potential changes in WTP associated with macroeconomic changes (Loomis & Keske, 2012). Another modified "experimental" subset of surveys queried respondents about response certainty and WTP an entrance fee. The 2009 surveys are the subject of this particular article.

The 2009 study was conducted at Quandary Peak, a Fourteener that is approximately 60 miles southwest of Denver, Colorado. As shown in Figure 1, Quandary Peak is located approximately 10 miles directly south of the ski resort town of Breckenridge and 10 miles directly north of Alma. In addition to winter skiing, the region attracts visitors to four nearby Fourteeners, which have shown to generate considerable economic benefit to the regional and statewide economy (Keske & Loomis, 2008). Quandary Peak was selected for evaluation because it served as one of the stratified peaks in the original 2006 study (Keske & Loomis, 2007, 2008; Loomis & Keske, 2009), and it has been part of a mountain ecosystem recreational carrying capacity study since that time (Lohman, Keske, & Kelly, 2011).

In articles previously published from the study region, the authors attribute the high consumer surplus to the concept that Fourteeners are considered synonymous with Colorado's identity (Blake, 1999, 2002, 2008). There are 54 Fourteeners in the state of Colorado, which has the majority of the Fourteeners in the continental United States. Nearly all of the Colorado Fourteeners are located at least in part on USFS lands. Fourteener references are ubiquitous, appearing on everything from Chamber of Commerce information to advertisements to postcards. Blake (2002) indicates that more easily recognizable Fourteeners, such as Long's Peak in Rocky Mountain National Park and Pikes Peak in Colorado Springs, provide a national identity.

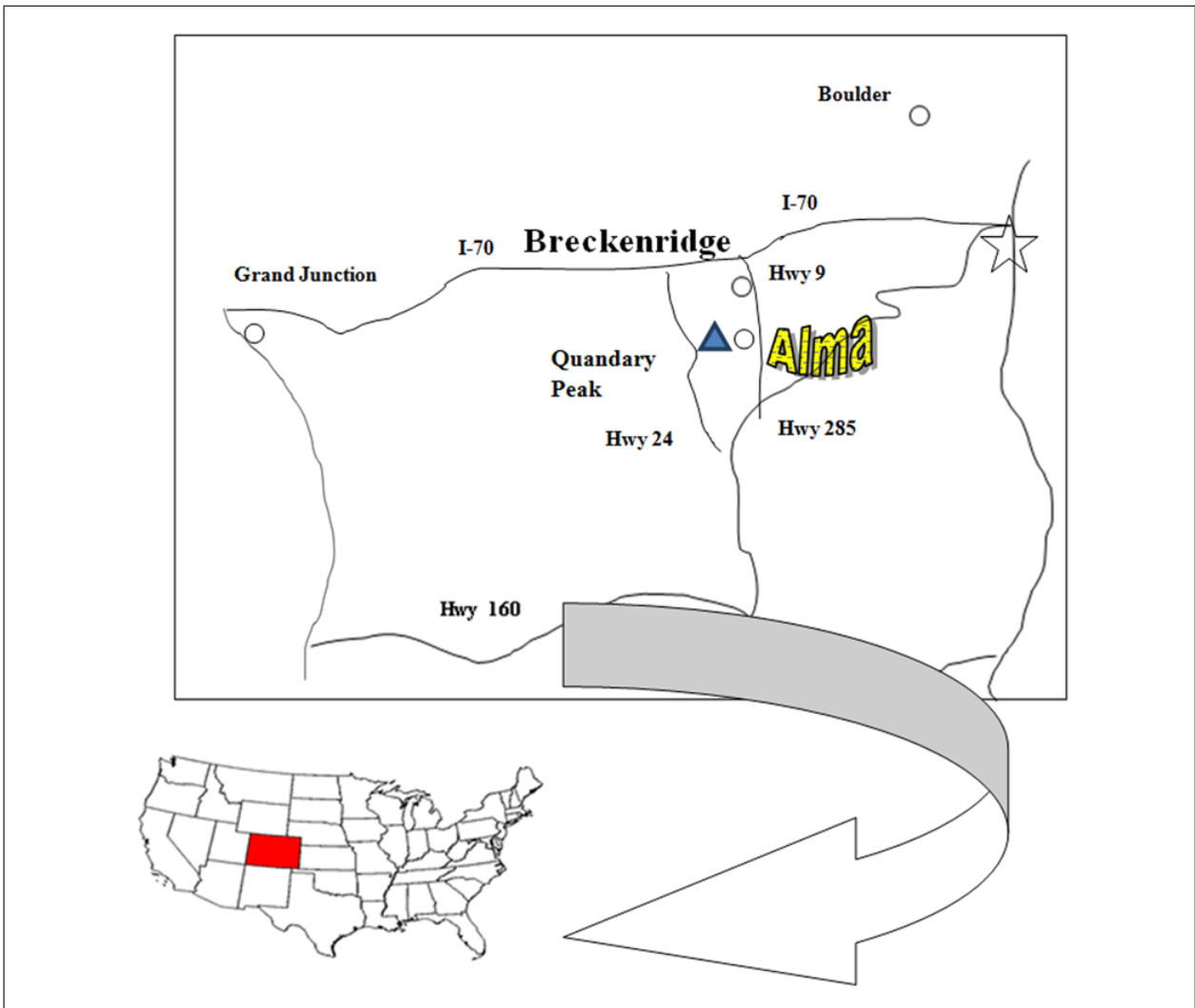Place identity research like that done by Blake (1999, 2002, 2008) is part of a larger body of the "sense of place"

Figure 1. Map of study area.
Note. The map is scaled to reflect the study region and areas where Fourteeners are located. The eastern third of the state has been omitted from the map.

literature. Sense of place research prevails in the sociology (Cross, Keske, Lacy, Hoag, & Bastian, 2011), environmental psychology (Kyle, Graefe, Manning, & Bacon, 2004), and geography literature (Manzo & Perkins, 2006). The central concept that there can be a psychological connection between a community and a natural resource like recreation has been tied to the New West economy (Keske & Smutko, 2010). Recent studies indicate that sense of place encompasses three separate and measurable dimensions: place attachment, place identity, and place dependence (Hummon, 1992; Jorgensen & Stedman, 2006; Kyle, Graefe, & Manning, 2005; Williams & Vaske, 2003). Each of these three dimensions represents a distinct type of experience in place: emotional attachments, cognitive expressions, and behavioral expectations (Jorgensen & Stedman, 2001; Kyle et al., 2005; Williams & Vaske, 2003). This article does not specifically explore the different senses of place dimensions, so the term is used more broadly in the analysis and discussion. As documented in the prior Fourteener studies and other social science literature, Fourteeners present a unique hiking and recreation experience. A high WTP is consistent with other disciplines' studies that recognize there is something unique about Fourteeners and their recreators.

The desirable recreation that drives sense of place and economic development in the New West must be balanced with the environmental damages that result from human impact, even with nonconsumptive recreation like hiking. Whereas nonconsumptive recreation arguably does not

encompass the same degree of environmental impact as extraction like mining and timber, high trail use and crowding can result in trail widening, soil erosion, and decreased vegetation (McQuaid-Cook, 1978). Mountainous, high alpine zones are vulnerable to nonconsumptive recreation damage, in part due to the fragility of and difficulty reestablishing vegetative cover at high elevations (Lohman et al., 2011). Soil science and ecosystem research has shown that nonconsumptive recreation such as hiking, camping, and horseback riding measurably degrades alpine trails and that specific trail sections are more vulnerable because of a confluence of topographic features that include elevation, slope, and aspect (McQuaid-Cook, 1978; Yonker, 1981). A 2010 study by Lohman et al. (2011) specifically documents trail widening and soil erosion resulting from hiking at the Quandary Peak study site.

Policies aimed to protect environmental quality or reduce crowding could backfire. For example, fees imposed by policy makers to reduce crowding and reduce environmental impact evoke income and residential equity issues (Chung, Kyle, Petrick, & Absher, 2011). Residents that choose to live near Fourteeners could be disproportionately affected by policies set in place intended to reduce their use of the very amenity that attracted them to live in the region (Quillen, 2010). Likewise, a fee could deter outside visitors whose purchases inject revenues into rural economies in need of off-ski-season commerce (Keske & Loomis, 2008).

The debate about the impact of recreational fees on regional and national economies is also complicated. In their part of a jointly written, two-part seminal 1987 article, Harris and Driver note that complex discussions about whether to charge recreational use fees on public lands have taken place for more than 100 years. Binkley and Mendelsohn (authors of the second article co-appearing with Harris and Driver), support fee implementation, noting that from a budgetary standpoint, recreation usage fees increase recreational access to multi-use USFS lands that would otherwise be expected to garner revenues from timber, mining, or grazing (Binkley & Mendelsohn, 1987). Recreational opportunities and acreage devoted to recreation could further expand if these areas could be demonstrated to be self-sustained by user fees rather than as a federal budget line item. From this perspective, charging an entrance fee might arguably increase recreational opportunities that drive New West economies. CVM methodology and WTP measurements, as applied in this study, can be useful to policy makers deciding whether to implement user fees and the price that should be charged (Shultz, Pinazzo, & Cifuentes, 1998).

The actual impact of fees on regional economic development, however, is complex and largely unmeasured (Godfrey, 2001). Part of the challenge in measuring the economic impact of user fees is the long-standing challenges of quantifying the economic impacts and value of recreation in general (see Dwyer, Kelly, & Bowes, 1977; More, Stevens, & Allen, 1988; Smith & Kopp, 2000). Various economic approaches, like IMPLAN (Keske & Loomis, 2008) and a computable generalized equilibrium model (Seung, Harris, Englin, & Netusil, 2000), are commonly used to measure the impact of recreation on regional and national economies, although the connection has not been made between recreational fees and regional economic development.

Strong sense of place to Fourteeners might lead to increased support of on-site fees. In two separate hypothesis tests, Kyle, Absher, and Graefe (2003) studied whether visitor attitudes with higher levels of place identity or higher levels of place dependence would be more likely to support a fee program for on-site education programs. The researchers found a positive correlation between place identity and support of fee programs for on-site education. Previous literature on respondent support and WTP for entrance fees to natural resource attractions has a positive and strong correlation to the visitor's perceived benefit from the natural resource amenity. Williams, Vogt, and Vittersø (1999) found that perception of fee benefits was the best predictor of support for user fees. Vogt and Williams (1999) also found park visitors were more willing to pay user fees when the fee purpose was to maintain a current level of service rather than to develop new programs.

This could, however, be confounded by whether visitors perceive a fee as being fair. Chung et al. (2011) used a two-step method to study the relationship between visitor place attachment, WTP a user fee, and visitor perceived price fairness at the Chattahoochee National Forest. Chung et al. observed a positive and significant linear relationship between perceived price fairness, spending support, and WTP a user fee. In their study, spending support had a partial mediating role in the relation to perceived price fairness and WTP a user fee. As individuals perceived that user fees in the study region were fair, they were more likely to support spending fees that would enhance facilities and visitor services, improve environmental protection, and develop interpretive and environmental education programs.

Despite results from the studies by Williams et al. (1999), Kyle et al. (2003), and Chung et al. (2011), it could be argued that an increase in USFS recreation fees could have a polarizing and divisive effect on the demand for recreation among local residents and outside community members. Hence, the objective of this study is to evaluate the impact of a proposed site use fee on visitor consumer surplus for Colorado Fourteener recreation, as well as the certainty with which respondents answer questions.

Methodology and Data Collection

Model Specification

Contingent valuation methodology is often used to estimate the value visitors place on recreation by measuring visitor

Table 1. Variables Under Analysis in Logit Model.

	Question	Description
Dependent variable		
Would you recreate?	As you know, some of the costs of travel often increase. If *your share* of the total cost of this most recent trip to the recreation area where you were contacted had been $(bid amount) *higher*, would *you* have made this trip to *this* 14'er?	0 = No, 1 = Yes
Independent variables		
BID Amount	$(BID) listed in the bid variable question	Ranges from $2 to $950
Uncertain	How certain are you of your response?	Recoded from 10-point Likert-type scale: 0 = Not certain, 1 = Very certain
Distance Traveled	What was your one-way driving or travel distance from your home to this 14'er?	Continuous distance respondent travelled in miles
Small Fee	Under current laws, 80% of any fees collected on site must be spent on improvements at that site. If a small fee ($20 or less) were required at this site, would you visit this site?	0 = No, 1 = Yes

consumer surplus and WTP for nonconsumptive uses (Christie, Hanley, & Hynes, 2007; Hanemann, 1994; Hanley, 1994; Loomis, 2002). CVM is a stated preference approach, in that it creates a hypothetical market by asking visitors how much they would be willing to pay for the experience (Mitchell & Carson, 1989). This is different from revealed preference methodology, which may use visitor travel behavior or number of trips made to a region to quantify recreation use values (Hanley, Wright, & Adamowicz, 1998; Stynes & White, 2006).

As previously stated, the objective of the study is to test respondent WTP for Fourteener recreation at Quandary Peak, whether the introduction of a small fee to access the recreation site would affect their decision to visit, and the certainty with which they have answered these questions. Hence, model specification is as follows:

Unrestricted Model:

$$\text{Log}\big[(\text{Prob YES})/(1-\text{Prob YES})\big] = \beta o - \beta_1(\$BID)$$
$$+ \beta_2(\text{Distance Traveled}) - \beta_3(\text{Small Fee}) - \beta_4(\text{Uncertain}) + \varepsilon$$

Restricted Model:

$$\text{Log}\big[(\text{Prob YES})/(1-\text{Prob YES})\big] =$$
$$\beta o - \beta_1(\$BID) + \beta_2(\text{Distance Traveled}) + \varepsilon$$

Where

"YES" is coded as 1, with the respondent stating a willingness to travel to the site
$BID ($X_1$) is the BID amount
Distance Traveled (X_2) is the distance traveled in miles

Small Fee (X_3) is a dummy variable coded "1" if respondent indicated a willingness to pay a small fee at the site
Uncertain (X_4) is a dummy variable coded "1" if respondent stated "very certain" willingness to pay a fee at the recreation site.

An expanded description of the variables is presented in Table 1, and the empirical model is further expanded on later in this section.

Statistical tests of differences would likely reveal a significant WTP for the price variable ($BID) as predicted by previous recreation studies on this topic (Keske & Loomis, 2007, 2008; Loomis & Keske, 2009) and at the Quandary Peak study site (Loomis & Keske, 2012). The expected sign is negative, to be consistent with the law of demand. In other words, as the bid variable increases, the probability that the individual would be willing to visit the site would decrease. A large consumer surplus is anticipated, as established by the researcher's aforementioned Fourteener studies. Likewise, it is expected that WTP would be positively correlated with longer travel distance, as also demonstrated in prior studies (Loomis & Keske, 2012). The correlation between a high WTP and longer travel distance has been attributed to place identity and the previously cited research, indicating that for many recreators, hiking a Fourteener is an experience of a lifetime (Loomis &Keske, 2009).

If the majority of individuals demonstrate a strong opinion either for or against a fee of $20 or less, there would be a correlation between WTP a fee and willingness to visit a site. According to previously discussed research by Williams et al. (1999), Kyle et al. (2003), and Chung et al. (2011), the expected relationship between WTP a fee and willingness to visit would be positive if recreators deem there would be

benefits from the fee. However, during the 2006 study, a small but vocal minority of hikers reported to researchers that they would actively oppose a USFS policy imposing a fee on Fourteeners. After the first academic studies were published, media attention followed and there was considerable blogging about the opposition to Fourteener fees (Quillen, 2010). Hence, there is a possibility of a statistically negative relationship between WTP a small fee and visitor recreation on Fourteeners.

In an attempt to minimize response bias, this study added a mechanism to measure response uncertainty, using a 10-point Likert-type scale in a similar manner as Loomis and Ekstrand (1997). According to prior studies (Champ & Bishop, 2001; Champ, Bishop, Brown, & McCollum, 1997; Champ, Moore, & Bishop, 2009), it is hypothesized that WTP would be affected by the certainty with which a participant is able to answer the question. In these studies, researchers recoded respondent yes answers when respondents reported that the certainty with which they answered a question was below a level of fairly certain to a no. Similarly, this study uses a dummy-coded response-certainty variable ("uncertain") in which respondents who answered below 6 were coded as uncertain and respondents who answered between 6 and 10 were coded as very certain.

This study takes the application a step further and asks respondents to report their response certainty on a 1 to 10 scale for *two* questions: the CVM question used to calculate consumer surplus and a second question about WTP a small fee. If respondents demonstrate a large amount of uncertainty, it is possible that recoding would be required to prevent response bias. If respondents demonstrate a high amount of certainty in answering their questions, then recoding would not be necessary, and there would be an estimate of whether there is a relationship between willingness to visit a site and whether the respondent exhibits a high degree of certainty answering the question.

Hypothesis Testing

The first hypothesis test consists of the price and travel distance explanatory variables from the prior Keske and Loomis studies, and tests for the significance of the coefficient for WTP a small fee (β_3) and the coefficient on the dummy-coded response certainty (β_4).

The first set of corresponding hypothesis tests are the following:

Ho$_{1a}$: $\beta_3 = 0$
versus
Ha$_{1a}$: $\beta_3 \neq 0$
Ho$_{1b}$: $\beta_4 = 0$
versus
Ha$_{1b}$: $\beta_4 \neq 0$

where the Hypothesis Test 1 indicates a test on the coefficients, the subscript "a" indicates testing the small-fee coefficient and the subscript "b" indicates testing the certainty coefficient.

The study further uses a log-likelihood ratio to evaluate whether there is a difference in the equation restricted to the price and travel distance variables (Loomis & Keske, 2012) and the equation when the small-fee and response-certainty-explanatory variables are added. Hence, the second hypothesis test is the following:

Ho$_2$: Restricted = Unrestricted = 0
versus
Ha$_2$: Restricted ≠ Unrestricted ≠ 0

The study also replicates the WTP results to determine whether there is a difference in the consumer surplus WTP for the restricted versus unrestricted model. Hence, the third hypothesis test is the following:

Ho$_3$: Mean WTP$_{restricted}$ = Mean WTP$_{unrestricted}$
Ha$_3$: Mean WTP$_{restricted}$ ≠ Mean WTP$_{unrestricted}$

Methodology

The first hypothesis test is evaluated by estimating a logit regression model to determine the significance of the coefficients. The coefficients are then used to calculate mean WTP (Hanemann, 1989) to conduct the third hypothesis test.

The utility theoretic foundations of the dichotomous choice model have been well developed (see Hanemann, 1984) and will only be summarized. It is assumed that an individual's utility is a function of a recreation experience at site *R* and the consumption of all other goods (represented by income *I*). The utility function may be represented as

$$U = f(R, I) \tag{1}$$

Utility from visiting a recreation site also depends on an individual's personal preferences, which are known only to that individual, so a portion of the utility function is not observable to the researcher. Therefore, some components of each individual's utility function are treated as stochastic, resulting in an indirect utility function and a random term, as follows:

$$U = f(R, I) = v(R, I) + e \tag{2}$$

where *e* represents an error term.

With the dichotomous-choice WTP question format, survey respondents are asked whether or not they would still take their most recent trip to the recreation site if travel costs were $BID higher. The respondent is predicted to answer "YES" if utility from the recreation experience, along with

the associated reduction of \$BID in income, is greater than the individual's original utility level without taking the trip. The "YES" respondent would take the trip ($R = 1$) at the higher travel cost ($I - \$BID$), and the "NO" respondent would choose not to take the trip ($R = 0$). Therefore, the probability of a "YES" response is represented as follows:

$$P\left(\text{YES} \mid \$BID\right) = P[v(R = 1, I - \$BID) \\ + e_1 > v(R = 0, I) + e_2] \tag{3}$$

where e_1 and e_2 are error terms with means of zero (Hanemann, 1984).

In the random utility framework, a visitor is predicted to respond "Yes" if the gain in the deterministic part of the utility function (the indirect utility difference) is larger than the difference in the stochastic part ($e_1 - e_2$). If the difference of the errors ($e_1 - e_2$) is logistically distributed, this gives rise to the parametric logit model. The stylized version of the model estimated is

$$\text{Log}\left[\left(\text{Prob YES}\right)/\left(1 - \text{Prob YES}\right)\right] = \beta o - \beta_1 \$BID \\ + \beta_2 X_2 - \beta_3 X_2 + \beta_4 X_4 + \varepsilon \tag{4}$$

where \$BID is the increase in trip cost the visitor is asked to pay, Xs are other independent explanatory variables, and ε is the error term. This model is estimated using a maximum likelihood estimator.

The second hypothesis test uses a Likelihood Ratio Test (Kmenta, 1986) to test for equality of coefficients in the logit WTP models between the restricted and unrestricted models. This approach compares the sum of the log likelihoods of the individual logit models (i.e., the unrestricted coefficient model) to the log likelihood of the pooled logit model (i.e., the model that restricts the coefficients). If this restriction is not rejected, then there is coefficient equality in the two time periods. The Likelihood Ratio Test follows a chi-square distribution.

For hypothesis test three, the mean WTP is calculated as follows:

$$\text{Mean WTP} = \left[\ln\left(1 + \text{Exp}\left(\beta_o + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4\right)\right)/ \mid \beta_1 \mid \right] \tag{5}$$

where β_1 is the coefficient on X_1 (\$BID), X_2 is the travel distance in miles reported by each survey respondent, X_3 is a dummy variable for WTP a \$20 fee (1 = yes; 0 = no), and X_4 is a dummy variable by which an individual was able to answer the question about whether they would pay a fee of \$20 or less (1 = certain; 0 = uncertain).

Differences in WTP values for the restricted versus unrestricted equations are evaluated as to whether the confidence intervals of the mean WTP values overlap (Creel & Loomis,

1991). Confidence intervals are calculated for the mean WTP using the variance-covariance matrix and a procedure developed by Krinsky and Robb (1986) and applied to dichotomous choice CVM by Park, Loomis, and Creel (1991).

Data Collection

To test for preferences in visitor WTP for recreation, a total of 200 surveys were distributed over three non–holiday weekends in July and August 2009. The mail-back survey booklet was designed consistently with Dillman's (2000) *Tailored Design Method*. To provide consistency, the surveys were distributed by one member of the research team: a graduate research assistant. Hikers were approached at trailheads and in parking lots at the conclusion of their recreation activity. After providing visitors with the survey and a postage-paid return envelope, names and addresses were also collected so that a second follow-up survey could be mailed to nonrespondents. A total of 120 surveys were returned for a response rate of 61%. The 200 surveys distributed and analyzed in this study differed slightly from the total surveys (370) distributed over five weekend days during July and August in the 2009 study because the uncertainty questions were added to the WTP questions. Individual expenditure data were also collected, but the results are beyond the scope of this publication. Respondents were also asked about the frequency of their visits to Fourteeners; 85% of respondents reported making a single trip to Quandary Peak. The same percentage of respondents visited less than five Fourteeners in the year prior to the survey date. Seventy-three percent of respondents said that visiting a Fourteener was the primary purpose or sole destination for their trip.

The dichotomous choice WTP question format asks whether the visitor would pay a specific increase in trip cost (the magnitude of which is varied across the sample) in addition to costs that they already paid for their current trip. This model is deemed more market-like and analogous to the price-taking behavior familiar to consumers than asking an open-ended question as to the maximum amount a visitor would pay (Loomis & Walsh, 1997). In this study, respondents were asked to circle a yes or no answer about whether they would be willing to incur additional costs above what they had already paid:

> As you know, some of the costs of travel often increase. If **your share** of the total cost of this most recent trip to the recreation area where you were contacted had been \$_____ **higher**, would **you** have made this trip to **this** 14'er? Circle one: YES   NO

Bid amounts (\$BID) ranged from \$2 to \$950, at 10 different price points. Values were identical to those from the original 2006 study, and surveys were randomly distributed to recreators. A count of returned surveys indicated that respondents returned a representative sample of bid prices.

Table 2. Logit Model Estimates of Restricted and Unrestricted Models.

Variable	Restricted model		Unrestricted model	
	Coefficient	Z-statistic	Coefficient	Z-statistic
Constant	0.492	1.65	0.991	0.86
Bid Amount	−0.008***	−4.14	−0.008***	−4.17
Distance Traveled	0.003***	2.63	0.003**	2.60
Small Fee			0.791	1.57
Uncertain			−0.687	−0.83
Mean DV	0.403		0.403	
Log Likelihood	−55.405		−52.295	
Prob > chi2			0.045	
Adjusted McFadden R^2	0.272		0.268	
Obs with DV = 0	71		69	
Obs with DV = 1	48		47	
n	119		116	

*, **, and *** indicate statistical significance of 10%, 5%, and 1%, respectively.

The survey WTP question was then followed by a 10-point scale querying respondents about the degree of certainty from their WTP:

How certain are you of your response? (Circle one number)

1	2	3	4	5	6	7	8	9	10
Not certain		Somewhat certain			Fairly certain				Very certain

The 10-point scale to measure uncertainty has been used in previous CVM studies (Champ & Bishop, 2001; Champ et al., 1997; Champ et al., 2009; Loomis & Ekstrand, 1998).

Another question was added to the survey querying respondents about their WTP a small fee at the specific site, Quandary Peak. A 10-point scale was added to the follow-up question in a similar manner to the dichotomous choice CVM question. The specificity of the fee question serves as a check of internal validity and a unique contribution to the literature. The question reads as follows:

Under current laws, 80% of any fees collected on site must be spent on improvements at that site. If a small fee ($20 or less) were required at this site, would you visit this site? YES   NO

How certain are you of this answer?

1	2	3	4	5	6	7	8	9	10
Not certain		Somewhat certain			Fairly certain				Very certain

Results

After compiling and entering the data, researchers reviewed responses to recode variables where respondents expressed that they were uncertain about their responses (Champ & Bishop, 2001; Champ et al., 1997; Champ et al., 2009). However, unlike previously published studies, only approximately 10% of respondents in this study expressed that they were uncertain in their response to either the WTP question or the fee question (i.e., they answered below 6 on the response certainty question). Instead of recoding the surveys, a dummy variable was added to the equation to evaluate the effect of uncertainty in answering the small-fee question on willingness to visit a site, as this comprised a small but distinct number of responses. Respondents' strong opinions may be attributable to the distinct sense of place with Fourteeners as a collection and as individual peaks. On approximately five of the surveys (less than 5% of the total), respondents commented about WTP an increase in general costs or a fee under certain circumstances. In their qualitative responses, these respondents expressed that they were truly uncertain about how to answer the question and that they might answer yes or no depending on the circumstance. This indicated that respondents gave thoughtful consideration to the questions and that this small number of individuals might rely on the perceived benefit from the fee, as noted in the Kyle, Graefe, and Absher (2002); Kyle et al. (2004); Vogt and Williams (1999); Williams et al. (1999); Williams and Vaske (2003); and Chung et al. (2011) studies. Unlike those studies, however, the respondents in this study seemed largely certain of their WTP a fee, irrespective of perceived benefit.

Table 2 shows the regression results for restricted and unrestricted models, as well as individual coefficients. As expected, the key price coefficient, the $BID Amount, is negative and statistically significant in both models. This serves as a validity check, indicating respondents took the dollar amount they were asked to pay seriously; the higher the dollar amount respondents were asked to pay, the lower the probability they would pay. Likewise, the travel distance

Table 3. Mean Willingness to Pay and 95% Confidence Intervals for Restricted and Unrestricted Models.

	Restricted model	Unrestricted model
Mean	$127.97	$132.79
95% Upper bound	$198	$200.71
95% Lower bound	$63.1	$68.31

is positively correlated with willingness to return to a Fourteener recreation site. Both $BID Amount and Distance Traveled are robust and significant to the 1% level of error, which is consistent with previous findings during the 2006 to 2012 study period.

However, the coefficients "small fee" and "uncertain" in the unrestricted model are also not significant. Thus, the first set of hypothesis tests that evaluates the significance of the individual coefficients cannot be rejected. This implies that a recreator's WTP a small fee and the degree to which they are certain about the answers to survey questions do not predict whether they are willing to visit Quandary Peak. This finding is also consistent with results of Loomis and Keske's first study that showed there is limited substitutability between specific Fourteeners (Loomis & Keske, 2009); the finding further reinforces Blake's sense of place research. To elaborate on these results, in one model, an interaction term small fee and uncertain was also evaluated, but this interaction term was also not significant. In another model, the uncertain question for the WTP question was also not significant.

The log-likelihood ratio results of the restricted and unrestricted models indicate that, in totality, there is a difference between the restricted and unrestricted models at a *p* value of .045. The McFadden adjusted *R*-squared test indicates that the restricted model has higher explanatory power compared to the expanded, unrestricted model. Thus, the second hypothesis test is rejected because there appears to be a significant difference between the restricted and unrestricted equations. These implications are further explored in the discussion and conclusions section of the article.

The mean WTP values are calculated as described in Equation (5). The WTP values for the restricted and unrestricted equations are not statistically different, as shown by nonoverlapping confidence intervals presented in Table 3. Furthermore, the mean WTP is nearly identical, indicating that there is not a strong effect on the consumer surplus from the restricted and unrestricted equations. Thus, the third hypothesis test is not rejected. This finding implies that imposition of a fee might not have an effect on potential WTP for recreation at a Fourteener and that consumer surplus would remain high regardless of whether a fee is imposed. One could infer that the imposition of an entrance fee might not negatively affect the regional and local economy, although there would likely be push-back, as described by the qualitative results presented in the next section and

in Table 5. In summary, there appears to be good internal consistency between the results, which are consistent with the sense of place literature and with prior Fourteener studies.

Discussion and Conclusions

The robust bid and travel distance coefficients and high mean WTP to visit a Fourteener ($131) are as expected. The findings are consistent with values obtained on previous Fourteener studies that demonstrate a substantially higher WTP than that of other outdoor recreation studies. In the context of other hiking studies, Ekstrand (1994) asked rock climbers at Eldorado Canyon outside of Boulder, Colorado (approximately 100 miles from the current study site), what they would pay to do similar climbs but at remote wilderness locations. His value of $27.95 per day in 1991 is substantially below the mean WTP of both control groups and the experimental group in our study. In other studies, Grijalva and Berrens (2003) estimate a value of rock climbing in Texas at between $47 and $56 per day trip, and Grijalva, Berrens, Bohara, Jakus, and Shaw (2002) find a WTP of only $20 to $25 per person to avoid closing climbing sites in several National Forest, National Park, and Bureau of Land Management wilderness areas. In a count data model using the "total cost method" to assay the value of climbing in the Italian Alps, Scarpa, Tempesta, and Thiene (2003) estimate (in Euros, which have been converted to dollars) a consumer surplus of $23 to $38 per day trip. Even when adjusting for inflation, the values of comparable outdoor recreation studies are clearly below the confidence intervals of this study. Furthermore, the WTP results are consistent with a WTP analysis conducted by Keske, Lohman, and Loomis (2013) on this same subset of surveys.

The insignificant coefficients on the small fee and uncertain variables are a bit unexpected and not consistent with previous studies correlating place identity and fee support. The researchers reviewed the surveys to verify responses and to gain further insight that could be used to address these concerns. A rather large number of qualitative comments provided by respondents support the premise that respondents understood the survey questions, and they gave considerable thought in their answers. Three respondents spontaneously commented that access to Fourteeners should be free. Another 37 of the 120 respondents (30.83%) commented that the high price of the bid variable prompted their response that they would not recreate at that Fourteener for the hypothetical costs. Of the 37, 12 respondents stated that the bid amount was simply "too costly" and 21 stated that they would hike at a different Fourteener, even identifying the substitute Fourteener where they would hike. This reinforces previous findings that there is a degree of substitutability between Fourteener peaks but that recreators for whom there is no substitute report a consumer surplus

Table 4. Cross-Tabulation of Small Fee and the Bid Variable.

Small fee	No	Yes	Total
No	26	17	43
Yes	43	30	73
Total	69	47	116

roughly triple that of those who are willing to substitute (Loomis & Keske, 2009).

Sixty-two percent of respondents report that they are willing to incur a fee of $20 or less to visit Quandary Peak. This finding, in concert with the qualitative comments, prompted researchers to investigate the relationship between bid amounts and the small fee. As shown in the Table 4, which provides a cross-comparison of responses, there is considerable variability between WTP and access fee and WTP the survey bid amount. Only 26 respondents answered no to both questions, whereas only 30 respondents answered yes to both questions. A review of written comments reveals differences in respondent motivations as to why many individuals are not willing to pay the bid amount but might be willing to pay a small access fee. Twenty-two additional and substantive qualitative comments were compiled pertaining to fees on Fourteeners. These are presented in Table 5. Comments like the ones below provide a simple elaboration on individual WTP an access fee:

The land belongs to the people. Fees are backdoor taxes.

Small price to pay for the benefit received. I would support a fee up to $50 per location. The experience is wonderful. I believe a fee is necessary to keep these areas from becoming run down over years of over use. Let's face the fact the Forest Service budget is not over flowing with excess amounts of capital to be able to maintain these areas in an excellent state of condition.

Other respondents stated that a fee might be appropriate in some circumstances, but verified that they were not willing to pay an access fee at Quandary Peak under current circumstances:

Anything else that didn't cost more than food, fuel and small gate fee. The reason I moved to Denver was to enjoy the mountain and don't at this time see a reason for this cost.

If you want to charge a fee—charge it to out of state visitors.

Respondents with uncertain responses also indicated that they might be willing to pay fees under certain circumstances:

I think there should be a voluntary fee—like museums in New York City.

Would pay fees at a lower cost.

The diverse and rather divisive qualitative responses provide insight as to why the uncertainty and small-fee coefficients are not significant. Prior expectations formulated by previous studies, as well as the diverse qualitative responses, led researchers to test for differences between the restricted model from Keske et al. (2013) and the unrestricted model that adds the uncertainty and small-fee variables. The log-likelihood ratio shows a significant difference in the models with a *p* value of .045, indicating differences in the two equations. The unrestricted equation has slightly less explanatory power according to the McFadden adjusted *R*-squared test, which is consistent with the nonsignificant coefficients. Although the sample is not large, researchers have documented the effective use of the likelihood ratio test in considerably smaller samples (Geweke & Singleton, 1980).

In summary, the insignificance of the small-fee and uncertainty coefficients, confounding differences between restricted and unrestricted equations, and the results shown in the qualitative data led the researchers to conclude that respondents are conflicted about their WTP a small fee to visit Fourteeners. In other words, WTP a small fee does not have high predictive power on the probability that visitors will recreate at a Fourteener. Furthermore, the high consumer surplus expressed in terms of mean WTP is still high, even if a fee is instituted.

Although WTP a small fee is not predictive of WTP for Fourteener recreation, it should not be overlooked that respondents in this study report a relatively high degree of certainty in their responses, which helps explain why the coefficient on certainty is insignificant. The insignificance of a small fee is an indication of a relatively decisive opinion about the Fourteener recreation site—a finding supported by the qualitative data. The clear and divisive responses are consistent with the dichotomy of New West economies (Power & Barrett, 2001). Studies of New West economies demonstrate residents are conflicted between increases in "sustainable industries" like recreation that improve the prosperity of local residents but might jeopardize amenities such as recreation access, which is often among amenities influencing the relocation to rural areas (Power & Barrett, 2001).

The impact of a fee on local and regional economic development is still unclear and requires further study. Although a large consumer surplus has been shown, qualitative data reinforces that some recreators would not go to the site. However, it is uncertain how much money those recreators actually infuse in the local economy and whether there would be an economic impact from fewer visits. Furthermore, it is also not clear whether fee-based recreation might dissuade new residents from moving to a community. Reflecting on Binkley and Mendelsohn's 1987 article, an increase in recreational fees could increase revenues, and subsequently increase the

Table 5. Respondent Comments.

Against Fees

Please don't charge $ for hiking CO mountains!

Anything else that didn't cost more than food, fuel, and small gate fee. The reason I moved to Denver was to enjoy the mountain and don't at this time see a reason for this cost.

Charging fees to enjoy nature is not the answer. It is the first step on a very slippery slope. Indicated would change to another Fourteener, "I'm not here to hike 13ers."

I think people participate in outdoor activities because they are free/or less expensive than Six Flags—attaching a cost would diminish use.

The land belongs to the people. Fees are backdoor taxes.

Your question about fees is troubling. As a Colorado citizen I already pay state taxes and as mentioned earlier, I pay for a state park pass and buy a habitat stamp. I'm beginning to believe the state is wanting to nickel and dime us to death instead of practice fiscal responsibility. If you want to charge a fee—charge it to out-of-state visitors.

We have no money.

My general feeling is that access to the national forests should be free with the exception of paying for camping.

It would be nice to have a bathroom (even port-a-potty) at each trailhead, bigger parking areas, figure out how to prevent beetle kill, better signage on streets.

Please do not make Colorado a state where you have to pay to hike like WA & CA.

Please don't charge an entry fee to 14ers! "Voluntary" collection boxes are okay. I hate paying to hike.

In Favor of Fees

For use of restrooms (3), or improved access road conditions (would pay)-2

So much more to do that is free or more affordable in area (would pay small fee)

It might be reasonable to charge a fee at very busy sites like Quandary—elsewhere it would be more frustrating.

Regarding fee: Small price to pay for the benefit received. I would support a fee up to $50 per location. The experience is wonderful. I believe a fee is necessary to keep these areas from becoming run down over years of overuse. Let's face the fact the Forest Service budget is not over flowing with excess amounts of capital to be able to maintain these areas in an excellent state of condition.

We definitely hike 14ers but we hike daily—to 12, 13, or 14. Our goal is beauty in all its variety. If 14ers are overused and the front range is—please promote 13ers & other great day hikes.

Charging fees for access would be acceptable if there could be "passes" like the national parks pass or visual explanation on site of how the $ is going to conserve and help improve recreation at the sites.

I live in the area and $150 for a hiking trip is much too expensive. This trip was a trip for my friends to see CO, not hike a 14er, especially if it cost $150+ (However. would pay fee).

Uncertainty About Paying Fees

I think there should be a voluntary fee—like museums in New York City.

Would pay fees at a lower cost.

If other 14ers were free we would go there instead, but if all were free areas we would probably still try to bag peaks. I often see people walking off trail, signs to educate and discourage would be good at trailheads (uncertain response and no to fee).

number and quality of Fourteener recreational opportunities, regional economic development, and Fourteener/recreational jobs.

The relationship between recreation opportunities and rural development is complex and worthy of further exploration—an observation that has not gone unnoticed by local residents in the study region. A recreation fee that might discourage visitors who would otherwise spend their money in the local communities that surround the area would likely be met with local opposition. There is at least some evidence to suggest that residents in these New West mountain communities in the study region may be willing to institute government policies to expand recreation. For example, the town of Alma in 2005 (the town nearest to Quandary Peak) agreed to indemnify landowners of mining claims on high mountain peaks from injuries sustained by recreators who were trespassing on their land (Keske & Loomis, 2008).

Members in the surrounding community have also signaled to researchers their support for pro-recreation policies. In two 30-person community focus groups conducted in the study region (Keske & Smutko, 2010), respondents were almost evenly split (48% and 48%, respectively) between the statements that an expanded heritage and recreation economy would be compatible with the lifestyle of their community or that it would change the lifestyle of their community to some degree, although a total of 96% of respondents believed that an expanded heritage and recreation economy would be a good fit for the region. One individual (4%) dissented to both questions, voting that expanded tourism would negatively affect the lifestyle of the community and that it was not a good fit for the region.

Findings from the Keske and Smutko (2010) study do not support a correlation between WTP a small fee and stated WTP for Fourteener visits. In fact, the majority of respondents

stated that they would be willing to pay a $20 (or less) fee for recreation at Quandary Peak, although clearly a fee increase would disproportionately affect low-income recreators and those who live near the Fourteener. Understandably, further research should be conducted at the specific study area before such a policy is implemented so that policy makers can better understand the trade-offs from any proposed fee. Likewise, future research should be expanded to specifically investigate what effects, if any, a fee might have on the rural, regional New West economies located by these Fourteeners.

This study reflects one additional step toward understanding visitor WTP to visit unique recreation areas that are part of the New West economy. Irrespective of whether there is a measurable change in economic development or visitor recreation, there will likely be a substantial and vocal number of visitors who will oppose such a policy. The anticipated reaction is perhaps best articulated by one respondent: "Charging fees to enjoy nature is not the answer. It is the first step on a very slippery slope."

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