

## Structural Equation Modeling of Users' Response to Wilderness Recreation Fees

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This paper examines wilderness users' response to recently established overnight camping fees at the Desolation Wilderness in California. Fee program evaluations have typically focused on economic or revenue issues, distributional or equity impacts of various pricing strategies, and questions of price fairness. In the case of wilderness recreation fees, it is also important to recognize the complex public purpose of wilderness and the long history of not having access fees in wilderness. To evaluate these various factors, this paper examines the impact of past wilderness experience and residential proximity on response to wilderness use fees using data from the 1997 Desolation Wilderness Fees Study. The results suggest general support for wilderness use fees, but fees are judged to be less appropriate for wilderness than for more developed recreation facilities and services. Structural equation modeling shows that experienced wilderness users, experienced Desolation Wilderness users, and users residing in close proximity to the Desolation Wilderness are less supportive of fees and less likely to see positive benefits from fees. A history of paying fees for access to other recreation sites and perceptions of wilderness problems, though positively related to past wilderness experience, do not contribute to fee support.

**KEYWORDS:** *Wilderness, recreation fees, pricing, wilderness experience, structural equation modeling*

### Introduction

In 1996, the U.S. Congress established the Recreation Fee Demonstration Program which directed some federal land management agencies to examine the feasibility of recovering a portion of the costs of operating and maintaining recreation programs through expanded use of recreation fees. This new policy represents a significant break from past fee collection practices, which have generally only allowed fees to be charged for developed

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recreation areas. Until this most recent policy change, fees have not been charged for wilderness access and dispersed camping. In response to the new policy, the U.S. Forest Service in early 1997 selected the Desolation Wilderness in northern California as a demonstration site to evaluate public response to wilderness use fees.

The application of the fee policy to wilderness warrants special attention for two reasons originating in the relatively unique context of wilderness vis-a-vis other federal recreation areas. One aspect of wilderness already alluded to is that it does not have a history of use fees (although there have been administrative fees for permits in some places). The second factor is that the very "wildness" of wilderness is seemingly challenged by a fee-for-access policy. Consequently, the purpose of this study is to examine support for wilderness use fees using a structural equation approach to explain users' response to fees as a function of previous experience, residential proximity, income, past fee payment history, perception of wilderness conditions, and perceived benefits of fees.

### Background

#### *Recreation Fee Research*

The issue of increasing and expanding recreation fees on federal lands in the United States has a fairly long history (Johnson, 1991; Wellman, 1987). Consequently, numerous studies have attempted to analyze the potential impact of fees and, for the purposes of this paper, can be grouped into three categories: economic efficiency and revenue impacts, distributional impacts, and perceived fairness of fees for public recreation services and facilities.

Economic and marketing research on recreation fees has addressed two closely related issues: economic efficiency (Rosenthal, Loomis, & Peterson, 1984; Walsh, Peterson, & McKean, 1989) and the impact of fee increases on revenue (Becker, Berrier & Barker, 1985; Fesenmaier & Schroeder, 1983). These studies have generally argued that fees tend to increase economic efficiency; that is they maximize benefits to society (Leuschner, Cook, Roggenbuck, & Oderwald, 1987; Rosenthal et al., 1984; Walsh et al., 1989). Similarly, from a business or marketing approach, an important consideration in pricing has been the degree to which consumers will accept higher prices to increase revenues. Marketing analysts often consider such factors as product uniqueness and availability of substitutes and employ the concept of brand or product loyalty to evaluate pricing policies (Upshaw, 1995). The presumption is that loyal customers are more likely to absorb higher prices. Moreover, Walsh et al. (1989) note that visitation impacts due to price increases at recreation sites tend to be small because, for most recreation sites, people readily absorb the additional (marginal) cost of an increased fee which is small relative to the total cost of a trip to the site. This is especially the case with natural resource-based recreation where there is often a fairly high travel cost (greater travel distance) involved.

Perhaps even more serious from a social policy standpoint are the distributional impacts for recreation fees (Leuschner et al., 1987; McCarville,



1995; Reiling, Cheng, & Trott, 1992; Walsh et al., 1989). These appear to be of two types. One concerns equity with respect to income, the other with respect to geography. Equity across distributions of income is concerned with the possibility that fees may exclude low income groups more than high income groups because fees absorb a greater proportion of discretionary income for low income groups. Much of this work has employed theoretical predictions from economics to support arguments that low income groups are likely to be disproportionately affected (Rosenthal et al., 1984; Walsh et al., 1989). Empirical studies have found little distributional impact across income in natural resource contexts, however, because incomes tend to be high among those who visit these sites (Leuschner et al., 1987; Mangun & Loomis, 1987; Reiling et al., 1992). In resource-based recreation, a more significant equity impact appears to be related to the distance people live from the site. Specifically, the travel costs associated with access to what amounts to a geographically "lumpy" or uneven distribution of resource-based recreation sites such as national parks, wilderness and national forests, create a geographically uneven distribution of fee impacts. Fees tend to have a high marginal cost for locals and therefore additional fees tend to reduce patronage most among frequent users who live nearby (Walsh et al., 1989).

A final area of research on fees concerns the fairness of fees for recreation sites given that such sites have benefitted from a well-established tradition of public subsidies. Though as of yet not applied to wilderness, this line of research would appear to be especially relevant for wilderness because the use of access fees has been almost nonexistent. This issue has received comparably little attention in economics (Kahneman, Knetsch, & Thaler, 1986). As distinct from the equity or distributional issue, price fairness has to do with consumers' perceptions of the reasons or justification for price increases. For example, during the oil crisis of the 1970s, the public thought that the increase in gasoline prices was an unfair attempt by oil companies to exploit the embargo by OPEC. The issue of price fairness, however, has had essentially no role in standard economic models of the efficient, profit-maximizing organization. As Kahneman et al. (1986) put it: "The economic agent is assumed to be law-abiding but not fair—if fairness implies that some legal opportunities for gain are not exploited" (p. 102). They conclude that perceptions of fairness are strongly influenced by how the issue of the price increase is framed. For example, with respect to housing rental prices, they found that demand-induced price increases unaccompanied by increases in costs tend to be judged as unfair. Thus, it appears consumers want to know and evaluate the justification for price changes and to hold private firms to some standard of fairness. It seems reasonable, therefore, to expect consumers to hold public service organizations to at least as high a standard.

Along these lines, studies of community recreation services also suggest that recreationists' reactions to price increases are conditioned by issues of fairness and past pricing policies. For example, McCarville and Crompton (1987) make a distinction between willingness-to-pay (a measure of consumer demand) and reference price (what consumers expect to pay) with the latter strongly influenced by pricing history. They found that providing

information to the public about delivery costs and the price of substitutes could increase the reference price, what people expect to pay and what they consider fair, because it draws visitors' attention to the "actual" cost of delivering the recreation service. Similarly, McCarville (1996) found that the price last paid serves as an anchor or reference point influencing current price expectations. In other words, it appears that public support for price increases are often contingent on the justification of the increase or what could be called the perceived fairness of pricing.

### *Wilderness and Recreation Fees*

Because fees for access to wilderness are so new, there has been little research on wilderness fees per se (as an exception see Leuschner et al., 1987). Based on the discussion of reference price above and considering the nature and meaning of wilderness, there are several reasons why support for fees in wilderness may be weak among those most involved in wilderness. First, the fact that the reference price for wilderness access has been essentially zero would suggest that people most familiar with wilderness (and therefore the reference price) may be less supportive of fees, depending on how they perceive the justification for the new fees.

Second, economic and market analyses of pricing assumes recreationists are paying for access to a wilderness product, service, or experience, yet much of the public rationale for the wilderness system is tied to broad goals of preservation and protection of nature which fall outside fee-for-access considerations. The public value and purpose of wilderness is not just associated with its operation and maintenance as a recreation site, but reflects a complicated mix of ecological or existence values as well as its recreational value. That is, wilderness preservation is often justified for its scientific, ecological, and other "non-use" values (McCloskey, 1990) which are not targeted or captured in economic oriented assessments of user fees.

Third, the meaning of wilderness itself is challenged by the very notion of charging access fees. Opponents of wilderness fees may be inclined to ask how an area which stands for solitude or primitive and unconfined experiences can have fees attached to it. In the past, recreation fees have been justified as necessary for areas where there have been significant facilities and improvements. The idea of having to pay simply for access to public lands is potentially much more intrusive on American sensibilities about "their" public lands. From this perspective the establishment of a fee might represent an inappropriate intrusion on the notion of wilderness. The fee policy, it could be argued, has the symbolic effect of "taming" the wilderness and violating American freedoms (see More, 1998 for a review of the philosophical arguments against fees on public lands).

Our purpose in raising these arguments here is not to advance their merits as justifications for or against specific fee policies, but to suggest that if such sentiments exist, they are likely to affect response to wilderness fees. Consequently this paper seeks to understand wilderness fees in a policy



sense, rather than seeking to model the optimal fee structure in terms of efficiency, distributional equity, or revenue. Our aim is to examine the potentially diverse reactions of users to the establishment of fees for wilderness. To illustrate, some users may support fees in order to maintain or improve the condition of something they value, yet at the same time regard them as philosophically inappropriate. Some users may have a long history of use of a wilderness area resulting in a sense of entitlement or personal ownership which is not compatible with paying fees. Some users may have little familiarity with wilderness and readily accept fees as a normal cost of its provision. Finally, some users may perceive a favorite wilderness area as lacking substitutes and willingly pay the new fees. In other words, one's familiarity, involvement, and commitment to wilderness as well as proximity (access) to wilderness may be an important determinant of one's evaluation of the fee policy. Moreover, familiarity and proximity may influence other factors that condition support for fees such as perceptions of the reference prices, perceptions of deteriorating wilderness conditions and wilderness management problems, and the belief that fees will serve to mitigate such problems.

As one attempt to improve understanding of wilderness users' response to the fees policy, this paper focuses on assessing fee response as a function of visitors' access to and familiarity with wilderness recreation, perceptions of wilderness conditions and problems, fee payment history, and perceived benefits of fees. Specifically, this paper examines (a) wilderness users' support for fees vis-a-vis other, more developed sites, and (b) develops and tests a structural equation model of the influence of previous use of wilderness and residential proximity to wilderness as sources of variation in wilderness fee response.

### *Modeling Fee Support*

Growing in popularity, Structural Equation Modeling (SEM) has already become a standard tool in the social sciences for investigating the plausibility of theoretical models. Briefly described, a SEM model (sometimes also referred to as covariance structure analyses) represents a series of hypotheses about how the variables in an analysis are generated and related (Bollen, 1989). Basic to SEM is a desire to explain interrelations among a set of variables with a model and then to test this model statistically. Model variables may be either manifest or latent. Manifest variables are simply variables that are directly measured, whereas latent variables reflect abstract (non-measured), theoretical constructs. Furthermore, the system of structural equations has two major subsystems: the measurement model and the full model. The measurement model is a confirmatory factor model in which the latent variables are described. The full model prescribes relations between several latent variables and/or measurement variables.

To evaluate wilderness users' response to access fees, our modeling focused on two sets of constructs to predict fee support, a set of exogenous (independent) variables and a set of endogenous (dependent or mediating)

variables. For exogenous constructs, this study focused on income, past experience, and residential proximity.

First, in any study of fees or pricing, an obvious potential variable influencing fee support is the income of the respondent. At some level, support for fees is likely to be contingent on ability to pay and therefore income needs to be considered.

Second, many recreation studies have employed past experience, involvement, and specialization as predictor variables because they theoretically should capture broad differences in orientations, attitudes, and world views regarding recreational activities that develop within recreation user groups (Dimanche, Havitz, & Howard, 1991; McIntyre, 1989; Pritchard, Howard, & Havitz, 1992; Schreyer, Lime, & Williams, 1984; Selin & Howard, 1988; Watson & Niccolucci, 1992; Wellman, Roggenbuck & Smith, 1982; Williams, 1988). Past experience would appear to be a particularly relevant variable in understanding wilderness users' response to fees because of rival conclusions from the economic/marketing perspective on one hand and the fairness or appropriateness perspective on the other. From the economic/marketing perspective, highly involved wilderness users may be more supportive of fees because they perceive them to be linked to improvements in aspects of wilderness that they highly value, including experience quality, more effective management of wilderness, and better protection of wilderness. In addition, the marketing objective of building consumer loyalty (frequent or regular users of a product) is in large part predicated on the idea that loyal consumers will continue to purchase a product (visit the area) after price increases (Crompton & Lamb, 1986; Upshaw, 1995). Finally, the concept of consumer surplus in economic theory recognizes that, at a given price, there remains a segment of the consuming population that is willing to pay higher prices (Walsh, 1989). This segment of consumers is likely to reflect high levels of involvement in the good or service although higher income may also be associated with greater consumer surplus.

Willingness to pay higher prices, however, is not the same as support for higher prices. It would be an unusual customer who, given a choice, would prefer to pay a higher price for something. Rather, from a fairness argument, the question is whether highly experienced wilderness users are more likely to focus on the underlying reasons (justification) for fees and the potential use and impact of fees on wilderness management and policy. Building from the fairness perspective, highly involved wilderness users are most likely to value the kinds of improvements in wilderness management which ostensibly would be supported by access fees. However, greater wilderness experience implies greater commitment to the experience of "wilderness" (of which a fee may serve as a detractor) and stronger support for the reference price (expectations of a subsidized price). In addition, wilderness involvement is likely to be associated with greater knowledge and interest in the "non-use" values of wilderness and lead to questions about whether fees will support broader preservation goals. In other words, highly involved users



are perhaps more likely to judge the merits of the fee on how well it will advance the goal of nature protection. Conversely, those less interested and involved in wilderness may support the access fees only if their perceived utility is high enough to justify the price (i.e., employ a rational consumer approach).

In addition to wilderness experience, a third exogenous variable potentially governing response to fees is residential proximity. With respect to residential proximity, economic research noted earlier suggests that those who live closest to a recreation resource are more likely to be negatively impacted by fee increases (because access fees represent a larger portion of the total cost when travel costs are included). Residential proximity, like past experience, may indicate differences in knowledge, commitment, and use patterns related to the Desolation Wilderness. Thus, local users are likely to be more familiar with the Desolation, more aware of the fee issue, and have different use patterns (more frequent trips, more short trips) than those users residing a greater distance from the area. Local visitors are also likely to feel some sense of "ownership" for the area and perceive the new fees as having a greater impact on local users than nonlocal users. With regard to proximity, both the economic and fairness arguments would be supported by a negative relationship between residential proximity to wilderness and fee support.

In addition to these exogenous variables, several mediating (endogenous) latent variables are considered. These include fee payment history, perception of wilderness problems, and perceived fee benefits. The research on reference price suggests that users develop expectations about price based on their past history of fee payments. In the case of wilderness (with rare exceptions) there has not been a history of paying fees, though users may have paid transaction fees to make advance reservations. However, users may have paid other fees for other outdoor recreation areas and they may tend to project these experiences onto wilderness areas. A history of having paid fees reflects both higher levels of involvement in outdoor recreation and may tend to make a wilderness user more accepting of fees for wilderness, given that they have demonstrated a willingness-to-pay for other forms of recreation and have become accustomed to making such payments.

Two additional mediating variables are the perception of wilderness problems and perceived benefits of fees. Again drawing on the fairness and reference price ideas, response to fees is likely to depend on awareness of potential fee benefits. In addition, those wilderness users with more experience and familiarity are more likely to perceive and be concerned about wilderness problems and therefore may tend to see potential benefits from fees. In other words, wilderness users who tend to think that the wilderness is suffering from worsening environmental conditions, may tend to perceive potential benefits from fees for wilderness management and, therefore, support the fee policy.

## Study Design

### *The Study Site*

The Forest Service selected the Desolation Wilderness as a test site and launched a comprehensive year-long visitor survey to evaluate the public's response to the new fees. Established in 1969, the Desolation Wilderness is a 63,469 acre area located in the Sierra Nevada mountain range just west of the Lake Tahoe Basin in California. Lake Tahoe is a popular tourist and seasonal home resort area which is very accessible to large urban populations in California (particularly people residing in the Sacramento Valley and the San Francisco Bay Area) and western Nevada (particularly Reno). Desolation's proximity to Lake Tahoe produces high proportions of tourist-oriented day users to the most accessible parts of Desolation as part of sightseeing activities around the lake. It also produces a large local resident user group with well established traditions of use. The generally recognized popularity and accessibility of Desolation to both local residents and more distant tourists were significant factors in the Forest Service's selection of Desolation as a fee demonstration area. Also significant, from a research standpoint, is that the Desolation Wilderness has been the site of several previous studies so there were good data on use and user characteristics which helped guide the development of the study (see Cole, Watson, & Roggenbuck, 1995).

Overnight campers at Desolation have been required to obtain a permit since 1972, but the Forest Service did not begin setting limits on the number of permits available until 1978. Currently, up to 50% of available permits are issued on a reservation system. There is a \$5.00 fee for the reservation, justified by the extra administrative expense required. The remaining permits have been issued on a first-come, first-serve basis at no charge. The Forest Service implemented the following fee schedule at the start of the 1997 summer season: \$5.00 to reserve a permit (as before); \$5.00/night/person, \$10.00/person/2 or more nights, and \$100/group maximum overnight camping fee; \$30 annual Desolation camping pass; and \$3/day (day use only) parking permit at the Eagle Falls trailhead.

The decision to use the Desolation Wilderness as a fee demonstration site received considerable local publicity, but it is difficult to judge what impact this may have had on the study. If anything, it may have made the fee issue somewhat more salient to respondents. At the time the overnight camping fee policy was established, there was also some discussion of establishing a day use fee. The decision to adopt a day-use fee was eventually postponed, but based on coverage in local newspapers and radio and direct public feedback given to Forest Service personnel, considerable local resistance to the proposal existed.

### *Sampling Design*

Following the procedures established in a 1990 user study, respondents were sampled from the overnight permits issued at Forest Service offices of



the Eldorado National Forest and the Lake Tahoe Basin Management Unit. Questionnaires were mailed to individuals who had requested permits for overnight Desolation visits to take place between June 1, 1997 and May 31, 1998. While use can occur year round, most use takes place in the summer and fall. Surveys were mailed throughout the year shortly after the trip associated with the permit was to have been completed. Three follow-up mailings were employed. A postcard reminder was sent one week after the initial mailing. Second and third questionnaires were mailed two and four weeks later as needed. Two different forms of the questionnaire (i.e., Forms A and B) were developed for purposes that are not relevant to the present study, but this strategy did guide the sampling design. Assuming a response rate of 75% (the 1990 study produced a 83% response rate) the initial target sample size was 667 for each form. Given annual average number of permits issued for the Desolation of 6,483 over the previous five years, permits were sampled using a constant interval of nine with a random start between one and nine (a different random start was used for each form).

Because sampling and mailing of questionnaires was a continuous process throughout the year-long study, the exact number of permits to be issued could not be known in advance. Due mostly to a smaller number of permits being issued than expected, the resulting sample sizes were lower than expected, but still quite adequate for statistical analysis. The sample size for Form A was 320 useable returned questionnaires out of 448 sent for a response rate of 71.4% overall return rate. For Form B, 314 useable questionnaires were returned out of 450 sent for an overall response rate of 69.8%. To check for non-response bias, respondents were compared to non-respondents with respect to information contained on the original use permit. No significant differences were evident in terms of party size, length of trip, origin, or season of use. Still, generalizations can only be made to overnight visitors who sought permits during the time period of the study. Consequently, this sample may tend to over-represent those most likely to comply with and therefore support fees. Nevertheless, compliance with overnight regulations is generally high because of and evidenced by active compliance checking efforts by the Forest Service and significant penalties for failure to secure a permit. Moreover, the focus of this analysis is to examine the relationship between fee support and involvement and residential proximity and not to make generalizations about the population parameters of Desolation Wilderness visitors.

### *Measurement of Constructs*

Given the overall goal of evaluating wilderness users' perceptions of the fee policy (as opposed to an analysis of economic or revenue impacts), there is no single theoretical approach to guide the measurement of response to fees. In the questionnaire, several strategies were used to measure wilderness users' response to recreation fees. To allow comparison with other recreational use fees, 18 scales measured respondents' "acceptance" of different

types of recreation fees. Specifically, respondents were asked how acceptable [a given type of fee] was on a scale from -2 (completely unacceptable) to +2 (completely acceptable). Included were fees for such things as boating, picnicking, swimming, developed camping, interpretive facilities, and both wilderness and non-wilderness activities and facility usage.

In addition, to identify a latent variable of wilderness fee support for the structural equation modeling, four attitudinal measures were used to assess broad response to wilderness camping fees: "How reasonable are the camping fees in general?" from 1 (extremely unreasonable) to 9 (extremely reasonable); "How do you feel toward the managers for implementing the camping fees at the Desolation Wilderness?" from 1 (definitely not upset) to 9 (extremely upset) (reverse coded for analysis); "How do you feel about the fee amount(s) you paid to camp in the Desolation?" from 1 (way too high) to 5 (way too low); and "How acceptable [the wilderness camping] fee was" from -2 (completely unacceptable) to +2 (completely acceptable) (i.e., the response to one of the 18 types of fees described above).

For past experience, a number of items have been used in the literature. The simplest and generally most effective approach is to measure previous use of both wilderness as a category and of the specific place. This approach has proved highly useful in distinguishing among various aspects of recreation experiences including attitudes, motivations, conflict, and management preferences (Schreyer, Lime, & Williams, 1984; Watson & Niccolucci, 1992; Watson, Roggenbuck, & Williams, 1991). For this study, past experience was measured using two variables: the number of previous Desolation trips and total wilderness trips in the previous three years.

To measure residential proximity, respondents were grouped into three geographic regions based on zip codes. Locals were defined as those who had zip codes from the Tahoe Basin area and Sierra Nevada mountain counties immediately adjacent to the California side of Lake Tahoe. Regionals were defined as those respondents with zip codes from the Reno-Carson-Minden area of Nevada, or the foothills and central valley areas (e.g., Sacramento) on the California side of the Sierra Nevada mountain range. Finally an out-of-area group was defined as all remaining respondents.

Income was measured using a question requesting the respondent to record household income into one of 10 categories ranging from "Less than \$5,000" to "Over \$100,000."

Among the endogenous constructs, fee payment history was measured using two items from a question about the number of times the respondent had paid fees for each of 18 types of outdoor recreation activities. In addition to asking about acceptance of these fees, respondents were asked how many times they had paid these fees in the past three years. One fee payment history measure was created by adding the total number of times fees were paid across six wilderness and camping related activities (camping at developed sites, wilderness camping, reserving a wilderness camping permit, non-wilderness backcountry camping, parking a vehicle at wilderness trailheads, and wilderness day trips). A second measure of fee payment history was cre-



ated by adding all the times the respondent had paid fees for the remaining 12 fee types.

Perception of wilderness problems was measured with two variables. First, respondents were asked to rate which among a list of 15 items they considered to be problems (e.g., litter, erosion, etc.). The variable was calculated by simply counting the number of items the respondent considered to be a problem. Second, respondents were asked which of these "problems" were becoming worse and again the variable was calculated as a simple count of the total number of problems getting worse.

Finally, to measure perceived fee benefits, responses to four items were used which measured beliefs about the use and effectiveness of fees. On a five-point scale ranging from 1 (strongly agree) to 5 (strongly disagree) (reverse coded for analysis), respondents rated the statements "I understand the reasons behind the Desolation Wilderness Camping Fees," "Overall, the Desolation camping fees are a good thing," "The Forest Service needs to charge the fees in order to maintain the quality of the natural environment and the services provided," and "The fee revenues will go directly into improving the natural environment, and the quality of services provided."

### *Structural Equation Models*

Three measurement models and two full structural models were designed. The three measurement models serve as auxiliary models which clarify whether the conceptualization of latent factors are homogenous and thus meaningful psychometric constructs. The first measurement model examines the latent construct of fee support as measured by the four items reflecting the underlying factor (Figure 1). The second measurement model addresses the four variables constituting the perceived fee benefit construct (Figure 1). The third measurement model tests whether the latent variable fee payment history (with two indicators) and the latent variable perception of wilderness problems (also with two indicators) are correlated (correlation is indicated by a two-way arrow in Figure 1). These two latent constructs are combined in one model as a way to over-identify the model (i.e., including more variances/covariances than parameters to estimate), which is a prerequisite for testing model goodness-of-fit (MacCallum, 1995).

The first full model (Figure 2) reflects a direct relationship from the four exogenous and manifest variables (wilderness trips, Desolation trips, proximity and income) on the endogenous and latent fee support variable. The direct model simply claims that exogenous variables have a direct impact on the fee support variable. Some of the exogenous variables are also allowed to correlate. The correlation paths were added as a model modification. This modification (a Lagrange Multiplier test in this case) tests the necessity of restrictions in the model. For example, if two variables are highly correlated in the variance/covariance matrix, and the researcher (unaware of this fact) suggests a model in which these variables are constrained to be independent, the Lagrange Multiplier test will estimate how much the model might be

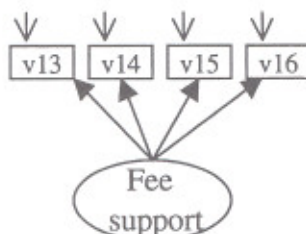
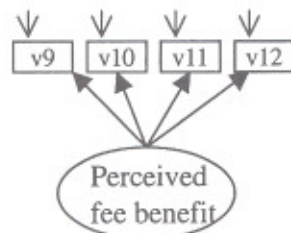
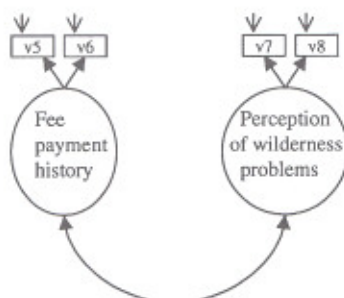
Model 1Model 2Model 3

Figure 1. The measurement models: Model 1—a measurement model with a latent construct of fee support influencing four manifest attitudinal measures: Model 2—a measurement model with a latent construct of perceived fee benefit as measured by four items assessing beliefs about the use and effectiveness of fees: Model 3—a measurement model with a latent construct of fee payment history (with two indicators) and a correlated latent construct of perception of wilderness problems (with two indicators).



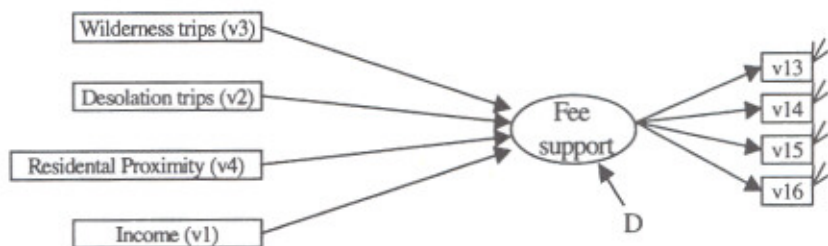
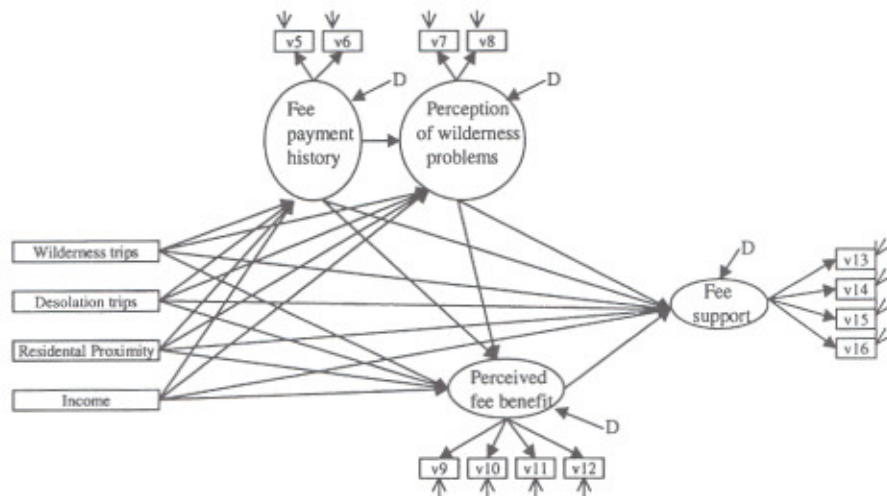
Model 4Model 5

Figure 2. The full models: Model 4—full model depicting a direct relationship from the four exogenous and manifest variables on the endogenous and latent fee support construct: Model 5—full model which additionally allows indirect relationships associated with the latent constructs of perceived fee benefit, fee payment history, and perception of wilderness problems. D = Disturbance (latent variable residual).

improved by releasing this restriction. Such a modification procedure is ad hoc, and does not reflect a strict confirmatory approach until it is cross-validated.

This modified structure is kept in the second full model (Figure 2), which additionally allows indirect relationships associated with the latent var-

iables of perceived fee benefit, fee payment history, and perception of wilderness problems to mediate some or all of the effects from the four exogenous variables on the fee support variable. In Models 4 and 5, all factor loadings were fixed according to the estimates made in the analyses of Models 1 to 3.

A critical issue in any SEM analysis is the assessment of model fit. The conventional overall test of goodness-of-fit assesses the magnitude of the discrepancy between the proposed model and the data by means of a chi-square test. A good model has a low chi-square value relative to the degrees of freedom because low chi-square values indicate a negligible discrepancy between the model and the data. However, some problems arise with the use of the chi-square test. For example, the chi-square test depends on sample size and it ignores the statistical power of the test. To overcome this and other problems, no single measure of overall model fit should be relied on exclusively. For this reason a number of so-called fit indexes have been proposed and are commonly used in a complementary manner (Bollen & Long, 1993; Hu & Bentler, 1995). In this study the Root Mean Square Error of Approximation (RMSEA, see MacCallum, Browne, & Sugawara, 1996) is used as one kind of fit index (a so-called absolute fit index). Contrary to the chi-square test, which relates to a strict yes or no decision regarding whether the hypothesized model is correct or not, the RMSEA focuses on the degree of fit between the data and the model at hand. It makes it possible to test models of close fit, not just models of exact fit. The RMSEA value should be small, preferably in the area of 0.06 or lower to indicate very good fit (Hu & Bentler, 1999). Moreover, the alternative hypothesis of a bad fitting model can be rejected if the 90% confidence interval for RMSEA falls below some given value, sometimes suggested to be .10 (MacCallum et al., 1996).

In addition to the RMSEA, an incremental fit index is utilized for fit evaluation in this study. An incremental fit index measures the proportionate improvement in fit by comparing a target model with a more restricted, nested baseline model. Typically, the incremental baseline model suggests that all the observed variables are uncorrelated, and the closer the index value comes to 1.0, the better the hypothesized model (and not the baseline model) fits the data. In this study the Comparative Fit Index (CFI; Bentler, 1988) is utilized as an incremental fit index. A CFI cutoff value close to 0.95 or higher is generally recommended (Hayduk, 1996; Hu & Bentler, 1999), although cutoff values having a magnitude of 0.90 or above are regularly seen in the literature as well (Bollen, 1989; Hoyle & Panter, 1995).

## Results

To put the issue of wilderness users' response to fees in a broad context, we compare use history, fee payment history, and ratings of acceptability for 18 different types of recreation activities (Table 1). In the table the different activities appear exactly as they did in the questionnaire. The percentage of respondents rating a fee as unacceptable ranged from a low of 2.4% for RV



TABLE 1  
*Acceptability of Recreation Fees by Desolation Wilderness Campers*

Activities	Use History (% who participated)	Payment History (% who paid)	Fee Response <sup>a</sup> (% rating unacceptable)
RV camping	11.4%	9.8%	2.4%
Use of motorized off-highway vehicle areas	18.5	3.0	10.5
Camping at developed sites	76.0	70.4	11.3
Visiting historic sites	62.4	36.4	15.9
Park or Forest entrance fees	n/a	74.5	17.4
Boating/Rafting/Canoeing	55.2	32.1	18.7
Environmental education programs	24.7	5.3	21.3
Use of picnic facilities	53.6	20.8	22.0
Wilderness camping	100.0	98.0	22.3
Reserving a Wilderness camping permit	78.6	76.7	22.5
Non-wilderness backcountry camping	67.2	29.5	23.1
Rock climbing	25.7	7.2	23.5
Visiting interpretive centers	58.6	16.5	24.5
Park or Forest-wide parking fees	n/a	37.0	27.1
Mountain climbing	42.4	16.2	27.6
Parking a vehicle at wilderness trailheads which offer facilities	85.2	37.3	29.9
Wilderness day trips	72.9	18.3	35.0
Swimming	69.1	17.3	38.1

<sup>a</sup>Low percentages suggest the user should pay their own way. Higher percentages suggest the user should not be charged and the service/experience/access should remain a public good. n/a = not asked.

camping to a high of 38.1% for swimming. Ratings of unacceptability for the four types of wilderness fees were 22.3% for wilderness camping, 22.5% for reserving a wilderness camping permit, 29.9% for parking a vehicle at wilderness trailheads which offer facilities, and 35.0% for wilderness day trips. While wilderness related fees are generally rated by a majority of users as acceptable, the percent rating these fees as unacceptable is larger than most other recreation fees with parking and day use fees being among the most objectionable of all fees. Interestingly there was virtually no difference in the rating of camping fees and reservation fees.

In addition to showing the percentage who found a given type of fee unacceptable, Table 1 also shows the percent who have participated in the activity and the percent who report having paid a fee for that activity within the last three years. Respondents appear to have considerable experience with a wide range of recreational activities. Most have participated in developed-site camping and picnicking, some form of boating, and visiting historic sites and interpretive centers. In addition, those respondents who have participated in these and other activities appear to have paid fees associated

with them. The fact that respondents indicate some history of participating in and paying for non-wilderness recreation facilities and services suggests that these respondents are familiar with a wide range of activities and at least partially conditioned to paying fees for many types of facilities and services. It must be remembered that all of these respondents presumably paid a wilderness camping fee in conjunction with securing the wilderness camping permit that was the basis of their inclusion in the sample. Thus, we would expect that 100% would report a payment history for wilderness camping and the actual reported result was 98%. The missing two percent might be explained as some combination of coding error and recall error.

To focus more specifically on why users support or do not support fees, the five structural equation models illustrated in Figure 1 were evaluated using EQS 5.7 (Bentler, 1995). Table 2 shows the correlation coefficients, standard deviations and means for the variables under study. Table 3 reports fit measures for the Models 1 to 5. Overall, the data supported all five models, though one measure of fit (the chi-square value for Model 5) was highly significant, suggesting poor fit. However, the chi-square/degrees of freedom ratio was only 1.6, and the other two fit indexes strongly supported the model. In addition, the entire confidence interval for the root mean square error of approximation is below .052, which allows us to reject the hypothesis that Model 5 has a bad fit (see MacCallum et al., 1996). Due to highly skewed data in Model 4 and 5 (Mardia's standardized multivariate kurtosis estimates were 42.4 and 56.8 respectively), the Satorra-Bentler robust test statistic was used to correct the chi-square distribution, the CFI and the standard errors for each parameter. Very briefly, the Satorra-Bentler robust test statistic works by correcting the normal chi-square by a constant, according to the principle that the greater the multivariate non-normality, the greater the chi-square is adjusted downwards.

Results from estimating Model 4 show direct effects of the four exogenous variables (previous wilderness trips, previous Desolation trips, residential proximity and income) on fee support were small but significant (Figure 3). The strongest effects on fee support came from previous wilderness trips and previous Desolation trips, both having a standardized regression weight (beta) of  $-.19$  ( $p < .01$ ). Residential proximity also had a negative effect on fee support ( $-.10$ ,  $p < .05$ ) as well. Income had a small, but positive effect on fee support ( $.10$ ,  $p < .05$ ).

Results from estimating Model 5 (Figure 3) indicate that the effect from Desolation trips and residential proximity are fully mediated by the perceived fee benefit variable. The direct effect found in Model 4 disappears in Model 5, although the indirect effect through the perceived fee benefit variable is significant. This latter variable, in turn, strongly predicts fee support ( $\beta = .82$ ,  $p < .001$ ). In our indirect model, previous wilderness trips both directly and indirectly affects fee support. Both paths are negative. The weak, but significant effect of income on fee support observed in Model 4 is reduced to a non-significant level in Model 5. This is because the covariance in Model 5 is divided between fee support and perceived fee benefit.

TABLE 2  
Correlation Coefficients, Standard Deviations and Means for the Study Variables

Model Variables	V1 <sup>a</sup>	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16
V1. Income	2.0															
V2. Desolation trips	.01	1.18														
V3. Wilderness trips	-.15	.28	0.65													
V4. Residential prox.	-.18	.23	.15	0.73												
V5. Fee history 1	-.03	-.03	.31	.01	1.02											
V6. Fee history 2	.06	.03	.07	-.03	.53	1.23										
V7. Problems 1	-.04	.13	.14	.03	.07	.11	2.37									
V8. Problems 2	-.08	.16	.10	.05	.09	.09	.50	2.42								
V9. Benefit 1	.03	-.18	-.13	-.14	-.03	-.05	.07	.01	1.17							
V10. Benefit 2	.10	-.25	-.17	-.15	-.01	-.05	-.05	-.02	.58	1.29						
V11. Benefit 3	.05	-.23	-.18	-.14	-.04	-.05	-.06	-.03	.47	.61	1.22					
V12. Benefit 4	.10	-.25	-.17	-.16	-.02	-.05	-.01	-.05	.60	.81	.58	1.24				
V13. Support 1	.11	-.22	-.19	-.13	-.05	-.05	.07	.02	.48	.51	.45	.56	2.58			
V14. Support 2	.15	-.27	-.26	-.19	-.02	-.01	-.03	-.11	.52	.62	.51	.68	.56	2.52		
V15. Support 3	.09	-.22	-.24	-.13	-.03	.06	-.01	-.06	.46	.55	.46	.61	.61	.63	0.76	
V16. Support 4	.11	-.26	-.24	-.17	-.02	-.01	.01	-.07	.49	.64	.50	.70	.60	.73	.71	1.40
Mean	7.64	0.77	0.57	1.53	0.95	0.95	2.59	1.65	3.92	3.71	3.63	3.60	5.87	6.39	2.54	0.82

Note.  $N = 458$  (listwise). Standard deviation reported in the diagonal. Correlation coefficients are significant at  $p < .05$  if greater or equal to .06.

<sup>a</sup>Variable numbers also correspond to the variables shown in Figure 1.



TABLE 3  
*Goodness-of-Fit Indexes for Models Related to Wilderness Recreation Fees*

	<i>N</i>	<i>df</i>	$\chi^2$	$\chi^2/df$	<i>p</i>	CFI	RMSEA
Model 1	537	2	5.9	2.95	= .051	.996	.061
Model 2	591	2	5.5	2.75	= .064	.997	.055
Model 3	584	1	0.3	.03	= .566	1.000	.000 <sup>a)</sup>
Model 4	499	19	21.9 <sup>c)</sup>	1.2	= .290 <sup>c)</sup>	.997 <sup>c)</sup>	.018 <sup>b)</sup>
Model 5	458	90	140.5 <sup>c)</sup>	1.6	< .001 <sup>c)</sup>	.974 <sup>c)</sup>	.042 <sup>b)</sup>

*Note.* *Df* = degrees of freedom;  $\chi^2$  = Chi-square test; CFI = comparative fit index; RMSEA = root mean square error of approximation. <sup>a)</sup> = Entire 90% confidence interval for RMSEA below .10; <sup>b)</sup> = Entire 90% confidence interval for RMSEA below .052; <sup>c)</sup> = Estimate calculated with the Satorra-Bentler robust statistics.

### Discussion

An important goal of this study is to understand how users evaluate the access fee policy for recreational use of wilderness in light of several issues that are somewhat unique to wilderness in comparison to other resource-based recreation settings. One issue is that the introduction of an access fee raises issues of price fairness and justification for the fee (i.e., why the money is needed, what will be done with it, and will it benefit wilderness experiences and protection?) given that heretofore wilderness access has been considered a public (i.e., completely subsidized) good. Not only does wilderness have non-recreational value (e.g., ecological preservation), its recreational value is premised on the condition of "wildness"—a condition associated with unconfined experiences. Taking a broad view, our findings suggest wilderness users generally support fees for public recreation (including wilderness), however, support levels for wilderness are generally lower than for other types of recreational resources. Recognizing the inherent limitations of drawing broad public policy conclusions from one visitor use study, the findings uphold the notion that fees for wilderness are not as strongly supported as fees for other resource-based recreation sites. This should serve to remind policy makers that public attitudes toward user fees is more subtle than simply a matter of yes or no, or even more or less. At the very least, a significant number (though by no means majority) of respondents in this study appear to think fees are not uniformly appropriate for all types of sites.

Although the access fee is new, some wilderness users have for some time been required to pay a "transaction fee" in order to make an advance reservation for a use permit. At the Desolation, fees associated with camping reservation permits have been in force for many years. Transaction fees are common in other recreation services. Concert and theater tickets bought through ticket brokers and plane tickets bought from a travel agent are examples of other leisure products with multi-part price structures. The results of this study show respondents are about equally unsupportive of the camp-

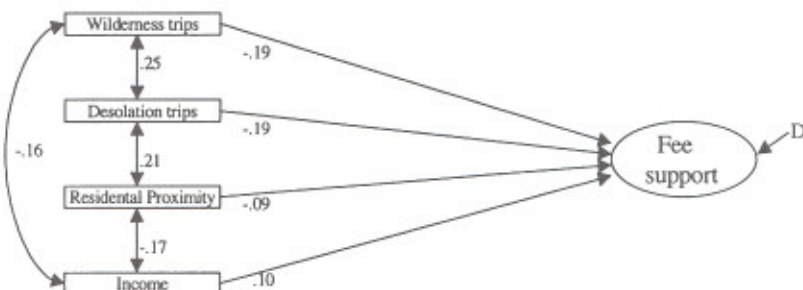
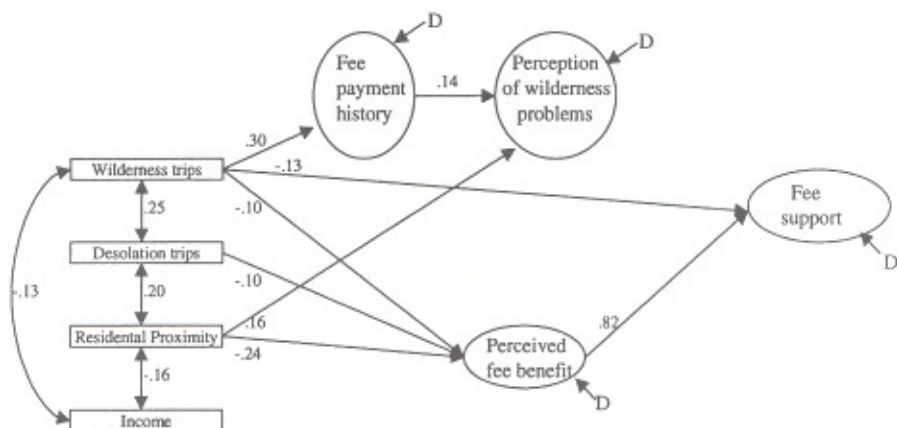
Estimated Model 4Estimated Model 5

Figure 3. Estimate of Model 4 and Model 5 for Desolation Wilderness visitors. Only significant parameter estimates (i.e., standardized regression weights) are included ( $p < .05$ ).

ing (access) fee (22.3%) as they are of the reservation or transaction fee (22.5%), even though the reservation fee has a longer history. Generally consumers are more willing to accept the cost of the experience/service, and are less agreeable to transaction fees unless significant benefits are realized with the transaction fees (e.g., no waiting in line, purchase at home). In this case wilderness users do not appear to differentiate much among these different types of fees. This may be due to the low transaction fee

relative to the lost opportunity cost of not being able to get a permit on a first-come, first-serve basis.

While there is modest support for wilderness fees overall, results of the structural equation modeling suggest a mixed picture regarding response to fees. These results generally support the view that more experienced and familiar wilderness and Desolation users are less supportive of user fees. This comes out in both Model 4 and Model 5. The simple interpretation of Model 4 is that more trips to wilderness, more trips to Desolation, and residing closer to Desolation all tend to be associated with weaker support for camping fees, while income is positively associated with fee support. If frequent wilderness or Desolation users benefit from a "consumer surplus" (i.e., are willing to pay more to use wilderness), this is not manifest as greater support for camping fees.

On the other hand, the idea that more experienced wilderness users or Desolation users might support fees because they see benefits associated with them was not supported. While there is a strong link between perception of fee benefits and support for fees, more experienced users were less likely to perceive benefits from fees and therefore were less supportive of fees. We also considered the possibility that more experienced wilderness users would be more concerned about wilderness conditions and as a result be more inclined to support fees. The results show that, while experienced users did tend to see more problems in wilderness, there was no significant link between problems and perceived benefits of fees or support for fees. Moreover, experienced users did not connect fee benefits to their increased tendency to perceive greater problems with wilderness conditions. Finally, we also thought support might be conditioned through a history of paying for various recreation services. Here again fee payment history had no bearing on either perceived benefits of fees or fee support.

What do these results suggest about issues of fairness and concerns about the meaning of wilderness? Experienced wilderness users, more than locals or experienced Desolation users, have relatively complex views of the fees issue. After controlling for the influence of having paid for other kinds of resource-based recreation, perceptions of wilderness problems, and even any notion that fees might benefit wilderness preservation, the level of wilderness experience was still linked to a negative view of camping fees. Moreover, the structural equation modeling results tend to support the fairness view that a strong predictor of fee support is the perception that fees will benefit wilderness management in some way. This could be simply the idea that consumers want and expect value for the money. The problem, however, is that neither the most experienced visitors nor those who reside close to Desolation perceive as much benefit to the fees as less experienced visitors. In fact the changes in coefficients between Model 4 and Model 5 suggest experienced wilderness users, in particular, are resistant to fees for reasons that extend beyond their failure to connect fees to improvements in wilderness. Specifically, there remains a direct, negative relationship between previous wilderness trips and fee support even when the endogenous variables



of perceived benefits, perception of management problems, and fee payment history are added to the model.

The direct relationships between Desolation trips and fee support and between residential proximity and fee support observed in Model 4 are replaced with direct relationships to perceived fee benefits in Model 5. This suggests that the lack of fee support among locals and regular users of Desolation is better explained as a failure to see benefits from the fee. What makes this especially noteworthy is that if any users would be in a position to know about the reasons for and potential benefits from the fee, it would be just these users. Yet they appear to discount the idea of benefits. In other words they are not against fees, they simply do not see a reason for them or a benefit from them. In contrast to locals and regular Desolation users, experienced wilderness users seem to have a more complex way of looking at fees. Controlling for the fact that they basically do not see fees as beneficial and the fact that they have a history of having paid fees for recreation, they still have a more negative view of wilderness camping fees. In other words, their negative view of fees cannot be explained by other factors such as fee payment history, perceptions of management problems or perceived benefits.

The good news for wilderness managers is that the best predictor of fee support in the model is perceived benefits of fees. This is largely a conceptual argument, however. It can be thought of as analogous to the relation between behavioral intentions and behaviors in attitude theory. Clearly, if one perceives a benefit from a fee one would be inclined to support it. The point here, however, is that including a fee benefit construct, gives a better understanding of the reasons or lack thereof for public support of fees.

Benefits of fees appear to be good predictors of support for fees, an important principal underlying marketing and consumer satisfaction. That is, consumers are inclined to view product transactions from the perspective of "exchange" (Assael, 1993). Stated aphoristically: "You get what you pay for." However, this may come at a "price" to the managing agency by requiring the agency to show and be accountable for how it is "putting fee dollars to work." A user-pays policy changes the nature of the expectations and obligations between the parties (wilderness users and managing agency) from one of potentially shared responsibility (i.e., citizen and government) for the management and preservation of wilderness to one of exchange or reciprocity in which the user becomes a fee paying patron who expects and demands good service, but does not bear any particular responsibilities or obligations in return. A good illustration would be the attitude many movie theater patrons have regarding litter. Because they pay to see the film and pay premium prices for popcorn and other snacks, they tend not to feel much obligation to clean up after themselves when the film is over (despite efforts by theater operators to encourage them to do so).

An added irony, however, emanates from the tendency for frequent wilderness users, frequent Desolation users, and local users to be more skeptical of fee benefits than infrequent or more distant users. One would expect

those who are most involved in wilderness to care the most about its management and to be aware of the ways in which fees might benefit wilderness. Perhaps the simplest interpretation of our findings in this regard is that frequent and local users will bear a higher financial cost for a fee policy. This combined with perhaps assigning little value on the kinds of additional or improved services likely to come from fees may negatively slant highly involved users' assessment of possible benefits of fees. Another interpretation is that experienced users are less inclined to take a consumer's view of wilderness and associate price with quality. More experienced users, perhaps by virtue of the fact that they regard wilderness as a public good, are skeptical of the shift from a public perspective that embodies obligations and responsibilities on the part of users to a market or consumer perspective which tends to minimize the sense of stewardship on the part of the user.

These various interpretations are somewhat speculative. Consequently, more research is needed to rigorously evaluate public attitudes towards fees with greater attention to the criteria people use to judge appropriateness of fees. This involves going beyond the economic paradigm which tends to focus on how consumers are likely to evaluate policies in terms of "willingness to pay" and instead attend to the questions of "appropriateness to pay." By appropriateness we mean employing the judgments we make as citizens in a policy arena regarding the public or collective interest rather than as consumers. The criteria the public uses to judge appropriateness speak to issues such as social equity and environmental responsibilities as well as issues of value for service. These criteria are especially important in the context of undeveloped or dispersed recreation resources such as wilderness where public attitudes are more likely to reflect a mix of private and public goods.

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