Indicators and Standards of Quality for Ski Resort Management

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Indicators and standards of quality have received increasing attention in the field of parks and outdoor recreation. This study applied indicators and standards of quality to ski resort management. Based on a survey of skiers at four Vermont ski resorts, data are presented on standards of quality for 14 potential indicator variables. Study data were analyzed by level of skier ability and cluster analysis to help identify alternative skier markets based on standards of quality. Management and research implications of this study approach are discussed.

Indicators and standards of quality have become the focus of contemporary approaches to recreation management. They help define management objectives, which are often too broad or general to guide day-to-day management. Indicators of quality are specific, measurable variables that define the quality of the recreation experience. Standards of quality define the minimum acceptable condition of each indicator variable.

A brief example may help illuminate these definitions. A management objective for a park or recreation area—a wilderness area, for example—might suggest that visitors should be provided opportunities for solitude. This is a broad, qualitative statement that is helpful in general terms but is not specific enough to guide management. For example, what constitutes "opportunities for solitude," and how is solitude to be measured? Indicators and standards of quality provide answers to these types of questions. It may be determined, through a program of research on wilderness visitors, that the number of encounters with other groups along trails is a key measure of opportunities for solitude. Thus, number of trail encounters with other groups per day may be a good indicator of quality. Moreover, most visitors may report that once they encounter more than three groups along trails per day, they no longer achieve an acceptable level of solitude. Thus, the standard of quality for the number of trail encounters per day would be three.

By defining indicators and standards of quality, outdoor recreation can be effectively planned, monitored, and managed. Visitor facilities and services can be planned to ensure that standards of quality are met. Moreover, indicators of quality can be monitored over time, and management action can be taken, when appropriate, to ensure that standards of quality are not violated. This approach to recreation management is central to contemporary recreation management frameworks, including limits of acceptable change (Stankey et al. 1985), recreation management planning (Manning 1986), carrying capacity assessment process (Shelby and Heberlein 1986), and visitor experience and resource protection (Manning, Lime, and Hof 1996).

To date, these recreation management frameworks have been applied primarily to public parks and related outdoor recreation areas. We believe that the basic rationale underlying these management frameworks can be applied to commercial recreation areas as well. This article describes the application of indicators and standards of quality to alpine ski resorts in Vermont. Primary focus is placed on developing standards of quality. However, before the application of standards of quality to ski resorts is presented, the following section briefly describes the normative approach to standards of quality developed in the field of outdoor recreation.

A NORMATIVE APPROACH TO STANDARDS OF QUALITY

Not surprisingly, one of the most problematic issues in the normative approach to outdoor recreation management has been setting standards of quality. Such standards can be based on a variety of sources, including legal and administrative mandates, agency policy, historic precedent, expert judgment, interest group politics, and public opinion, especially that derived from outdoor recreation visitors. This latter source has special appeal since it involves those people most directly interested in and affected by recreation management decisions and actions.

Research on visitor-based standards of quality has relied heavily on normative theory and related empirical techniques. Developed in the fields of sociology and social psychology, normative theory has attracted considerable attention as an organizing concept in outdoor recreation research and management. As applied to outdoor recreation, norms are generally defined as standards that individuals and groups use for evaluating behavior and social and environmental conditions (Donnelly, Vaske, and Shelby 1992; Shelby and Vaske 1991; Vaske et al. 1986). If visitors have normative standards concerning relevant aspects of recreation experiences, then such norms can be studied and used as...
a basis for formulating standards of quality. In this way, recreation management can be carried out more effectively.

Application of norms to standards of quality in outdoor recreation is most fully described by Shelby and Heberlein (1986) and Vaske et al. (1986). These applications have relied heavily on the work of Jackson (1965), who developed a methodology—return potential curves—to measure norms. Using these methods, the personal norms of individuals can be aggregated to test for the existence of social norms or the degree to which norms are shared across groups. Such normative data are often plotted to form a social norm curve indicating the point at which the condition of an indicator variable falls below acceptable standards. Normative research in outdoor recreation has focused largely on the issue of crowding (e.g., Heberlein, Alfano, and Ervin 1986; Patterson and Hammit 1990; Shelby 1981; Vaske et al. 1986; Whittaker and Shelby 1988; Williams, Roggenbuck, and Bange 1991; Manning et al. 1995; Manning, Lime, and Hof 1996; Manning et al. 1996; Hall and Shelby 1996; Shelby and Heberlein 1986) but also has been expanded to include other potential indicators of quality, including ecological impacts (Shelby, Vaske, and Harris 1988; Manning et al. 1995; Manning, Lime, and Hof 1996), wildlife management practices (Vaske, Donnelly, and Shelby 1993), and minimum stream flows (Shelby, Brown, and Baumgartner 1992; Shelby and Whittaker 1995).

STANDARDS OF QUALITY FOR SKI RESORTS

The purpose of this article is to describe the application of standards of quality to ski resorts. The normative approach outlined above is the primary research method. Norms are developed for 14 potential indicators of quality based on data gathered from four ski resorts in Vermont. Data are also analyzed to determine whether norms vary by selected characteristics of skiers.

Research Methods

Fourteen potential indicators of quality were chosen for this study. By definition, indicators of quality are variables that skiers consider most important in influencing the quality of their experience. For this study, potential indicators of quality were identified by a panel of four ski industry “experts”—two ski area managers and two academics. The 14 potential indicators of quality identified were (1) daily lift ticket cost, (2) driving time from skier’s residence to the ski resort, (3) walking time from the parking lot to the base lodge, (4) type of day care services provided, (5) number of ski trails, (6) number of ski lifts, (7) maximum waiting time in lift lines, (8) percentage of terrain covered by snowmaking, (9) extent of snow grooming services, (10) extent of condominium development, (11) type of food service provided, (12) attitudes of ski resort employees, (13) type of accommodations provided, and (14) adequacy of base lodge facilities.

Standards of quality were developed for each indicator variable using the normative approach previously described. For each indicator variable, respondents were asked to evaluate a range of possible conditions. A 5-point response scale was used, anchored at 2 = very favorable and −2 = very unfavorable. For example, data on standards of quality for the first potential indicator variable, cost of daily lift ticket, were derived by asking respondents to evaluate the favorability of ticket costs of $10, $20, $30, $40, $50, and $60. The resulting data indicate the personal norms of the respondents and, when sample data are aggregated to form a norm curve, the social norm for the sample as a whole.

The 14 batteries of questions on standards of quality were included in a written questionnaire administered to a sample of 515 skiers at four ski areas in Vermont. The questionnaires were distributed at each ski area on one weekday and one weekend day in March 1992. Skiers were selected at random at the base lodges between the hours of 10:00 a.m. to 12:00 noon. Questionnaires were self-administered. An 81% response rate was achieved, yielding 419 completed questionnaires. Other questions were used to gather information on sociodemographic characteristics of skiers, skiing ability, and use patterns.

Descriptive Findings

Data for each of the 14 indicators of quality were aggregated for the sample as a whole into a series of social norm curves, as shown in Figure 1. These norm curves plot the average favorability rating for each point along the range of conditions for each indicator variable.

Norm curves have several properties that can be useful in developing standards of quality. The range of acceptable standards is generally defined as comprising all conditions of the indicator variable between the highest point on the norm curve and the point at which the norm curve crosses from the favorable range into the unfavorable range (the point at which the norm curve crosses the neutral point on the favorability scale). For the cost of daily lift tickets, the range of acceptable standards is $10 to approximately $33. The highest point on the norm curve suggests the most preferred standard of quality, and the point at which the norm curve crosses the neutral point suggests the minimum acceptable standard of quality. Norm curves may have inflection points—points at which favorability drops dramatically—and these points may also suggest appropriate standards of quality. The norm curve for daily lift ticket cost does not exhibit an inflection point.

Two other characteristics of norm curves may be helpful in formulating indicators and standards of quality. The height of the norm curve above and below the neutral point indicates how strongly respondents feel about a potential indicator of quality (i.e., how important the indicator is to respondents in determining the quality of the ski resort experience). If respondents do not feel strongly about a potential indicator of quality (i.e., if the norm curve does not extend well above and/or below the neutral point), then it should probably be dropped from consideration. The norm curve for daily lift ticket cost extends well above and below the neutral point, suggesting that the cost of daily lift tickets may be a good indicator of quality. The statistical variance around the points that define the norm curve indicates the degree of consensus about standards of quality. This characteristic of norm curves is called crystallization and is usually measured by standard deviations. The more consensus inherent in a norm curve (i.e., the lower the standard deviations), the more confidence one might have in using such data to set standards of quality. The averages of the standard deviations for the points comprising each norm curve are shown in Table 1. The average standard deviation for the norm curve for the cost of daily lift
FIGURE 1
SOCIAL NORM CURVES

[Diagram showing various social norm curves related to travel and resort experiences.]

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TABLE 1
AVERAGE OF STANDARD DEVIATIONS FOR THE 14 POTENTIAL INDICATORS OF QUALITY

<table>
<thead>
<tr>
<th>Potential Indicator of Quality</th>
<th>Average Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily lift ticket cost</td>
<td>.64</td>
</tr>
<tr>
<td>Driving time from skier’s residence to ski resort</td>
<td>.97</td>
</tr>
<tr>
<td>Walking time from parking lot to base lodge</td>
<td>.86</td>
</tr>
<tr>
<td>Type of day care services provided</td>
<td>.90</td>
</tr>
<tr>
<td>Number of ski trails</td>
<td>.97</td>
</tr>
<tr>
<td>Number of ski lifts</td>
<td>1.10</td>
</tr>
<tr>
<td>Waiting time in lift line</td>
<td>.75</td>
</tr>
<tr>
<td>Percentage of terrain covered by snowmaking</td>
<td>.92</td>
</tr>
<tr>
<td>Extent of snow grooming services</td>
<td>.96</td>
</tr>
<tr>
<td>Extent of condominium development</td>
<td>1.10</td>
</tr>
<tr>
<td>Type of food service provided</td>
<td>.83</td>
</tr>
<tr>
<td>Attitudes of ski resort employees</td>
<td>.83</td>
</tr>
<tr>
<td>Type of accommodations provided</td>
<td>1.01</td>
</tr>
<tr>
<td>Adequacy of base lodge</td>
<td>.97</td>
</tr>
</tbody>
</table>

The average standard deviation of the 14 potential indicators of quality was .64, indicating relatively strong consensus across the sample for this potential indicator of quality.

Inspection of the norm curves in Figure 1 and the data in Table 1 provide an empirical basis for developing standards of quality for the 14 potential indicators of quality included in this study. These data also suggest which potential indicators of quality might be the most meaningful. Indicators of quality with relatively high norm intensity and crystallization include cost of daily lift ticket, maximum waiting time in lift lines, type of food service, walking time from parking lot to base lodge, percentage of terrain covered by snowmaking, and attitudes of ski resort employees. These variables may be the most appropriate and meaningful indicators of quality.

Analytical Findings

The norm curves and data described previously are based on mean values for the sample as a whole. There may be groups of skiers or specialized markets, however, that vary from these mean values to a statistically significant degree. This kind of information would enable ski resort managers to target one or more markets by focusing on alternative standards of quality. Several approaches were used to differentiate between groups of skiers and skier markets, two of which are described in the paragraphs that follow.

The first approach examined norm curves for skiers of different skiing ability levels. In the questionnaire, skiers rated their ability level as beginner, novice, intermediate, advanced intermediate, and expert. Norm curves were calculated for each of these ability-based subgroups for each of the 14 potential indicators of quality. The Kruskal-Wallis and Mann-Whitney tests were used to determine significant differences between the five norm curves for each indicator variable (Nie et al. 1975).

Statistically significant differences were found among the five skier ability levels for six potential indicators of quality. One of these potential indicators of quality was cost of daily lift ticket. Resulting norm curves are shown in Figure 2. Beginner skiers were found to be significantly more sensitive to increases in daily lift ticket costs.

The second analytical approach was based on a cluster analysis of respondents. Cluster analysis is a statistical technique for grouping respondents based on their scores on selected questionnaire items (Nie et al. 1975). Questionnaire items used in the analysis were importance ratings assigned by respondents to the potential indicators of quality. Respondents rated the importance of each potential indicator of quality on a 5-point scale ranging from not at all important to extremely important.

Four clusters of skiers were identified (see Table 2). Cluster 1 might be considered “hard to please” skiers since they rated all of the potential indicators of quality as important or very important. Compared to other clusters, these skiers tended to be older and were more likely to be married; their annual household incomes were in the moderate range. Clusters 2 and 3 were more diverse in their importance ratings but were quite similar to each other. The primary difference between these clusters is that cluster 2 considered the cost of daily lift tickets to be of only slight importance, while cluster 3 considered it to be very important. With regard to socioeconomic characteristics, skiers in cluster 2 differed from skiers in cluster 3 by virtue of their older age, greater tendency to be married, and higher incomes. Cluster 4 represents a group of skiers that is focused almost exclusively on ski conditions. Ski conditions were rated by this group of skiers as very important, while all other potential indicators of quality were
<table>
<thead>
<tr>
<th>Cluster</th>
<th>Number of Skiers</th>
<th>Ski Conditions</th>
<th>Employee Attitudes</th>
<th>Size</th>
<th>Ticket Cost</th>
<th>Accommodations</th>
<th>Closeness to Home</th>
<th>Food</th>
<th>Day Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>99</td>
<td>Very important</td>
<td>Very important</td>
<td>Important</td>
<td></td>
<td></td>
<td>Very important</td>
<td>Important</td>
<td>Important</td>
<td>Important</td>
</tr>
<tr>
<td>87</td>
<td>Very important</td>
<td>Important</td>
<td>Important</td>
<td></td>
<td></td>
<td>Important</td>
<td>Important</td>
<td>Slightly important</td>
<td>Slightly important</td>
</tr>
<tr>
<td>134</td>
<td>Very important</td>
<td>Very important</td>
<td>Important</td>
<td></td>
<td></td>
<td>Slightly important</td>
<td>Slightly important</td>
<td>Slightly important</td>
<td>Not important</td>
</tr>
<tr>
<td>90</td>
<td>Very important</td>
<td>Slightly important</td>
<td>Slightly important</td>
<td></td>
<td></td>
<td>Slightly important</td>
<td>Slightly important</td>
<td>Slightly important</td>
<td>Not important</td>
</tr>
</tbody>
</table>

**TABLE 2**
IMPORTANCE RATINGS FOR POTENTIAL INDICATORS OF QUALITY FOR FOUR CLUSTERS OF SKIERS
Socioeconomic characteristics of skiers in this cluster tended to be rated as either not at all important or slightly important. So-
tial indicators of quality of the ski resort experience were
approach to the management of ski resorts. Fourteen poten-
ty. Once again, one of these potential indicators of quality
be close to sample averages.
Statistically significant differences were found among
the four clusters of skiers for six potential indicators of qual-
ity. Once again, one of these potential indicators of quality
was the cost of a daily lift ticket. Resulting norm curves are
shown in Figure 3. Cluster 4 was found to be significantly
more sensitive to increases in daily lift ticket costs.

DISCUSSION AND CONCLUSION

Indicators and standards of quality have proven to be an
effective approach to managing parks and related outdoor
recreation areas. The purpose of this study was to apply this
approach to the management of ski resorts. Fourteen poten-
tial indicators of quality of the ski resort experience were
identified by a panel of experts. Normative theory and tech-
niques were used to help develop standards of quality for
each potential indicator of quality. Data were gathered by
means of a survey of a random sample of skiers at four ski re-
orts in Vermont.

Study findings suggest that indicators and standards of
quality can be developed for ski resort management. Social
norm curves were developed for the 14 potential indicators
of quality. These norm curves help provide a rational and em-
pirical basis for setting standards of quality. Data on norm in-
tensity and crystallization suggest that 6 of the 14 potential
indicators of quality are especially meaningful to respond-
ents and should be considered as a primary focus of ski re-
sort planning, monitoring, and management. Study findings
also provide insights into how standards of quality vary
among subgroups or markets of skiers.

Indicators and standards of quality have a number of po-
tential implications for ski resort management. Perhaps most
important, they can provide a strong conceptual and empiri-
cal foundation for ski resort planning and management. By
definition, indicators of quality are variables that skiers re-
port as most important in influencing the quality of their ex-
perience. Thus, indicators of quality provide an appropriate
focus for ski resort planning and management. Standards of
quality help define the minimum acceptable condition of ind-
cicator variables. Thus, data on standards of quality can be
used to help plan, design, and manage appropriate facilities
and services for skiers.

Indicators and standards of quality can also be the focus
of a marketing program aimed at establishing and communi-
cating a ski resort's essential qualities. The empirical and
analytical nature of data on indicators and standards of qual-
ity lend themselves particularly well to target marketing.
Certain segments of the skier market may place more or less
importance on selected indicators of quality. Similarly, dif-
ferent standards of quality may be associated with different
target markets. The research reported in this study, for ex-
ample, found different standards of quality for six indicator vari-
bles based on skier ability. Differences in standards of qual-
ity were also found based on cluster analysis of nine potential
indicator variables. Such findings provide an empirical basis
for targeting selected markets of skiers.

There are a number of research issues concerning indica-
tors and standards of quality. More needs to be known about
potential indicators of quality for skiers. Which manageable
variables contribute to or detract from the quality of the ski
resort experience? The research reported in this study used a
panel of experts to identify 14 potential indicators of quality.
Moreover, resulting data indicate which of these indicator
variables are most important to respondents. However, more
research is clearly warranted.

More research on standards of quality is also needed. The
normative approach to setting standards of quality appears
promising. However, the extent to which skiers and other
outdoor recreationists have norms, and the extent to which
there is wide agreement or consensus about such norms, is
the subject of some debate (Noe 1992; Roggenbuck et al.
1991; Heywood 1996; Shelby and Vaske 1991; Manning,
Johnson, and VandeKamp 1996; Lewis, Lime, and Anderson
1996). Furthermore, there are several methodological issues
associated with norm measurement. Should questions de-
sign to measure norms employ the notion (and related
wording) of preference, acceptability, favorability, toler-
ance, or some other concept? Preliminary research suggests
that question wording can substantially influence resulting
norms and standards of quality (Manning, Valhere, and Ja-
coli 1997).

Research on indicators and standards of quality for parks
and related outdoor recreation areas has become increasingly
sophisticated, and many of these techniques and approaches
may be readily transferable to ski resorts and other commer-
cial recreation facilities. For example, visual techniques have
been used to illustrate a range of conditions in indicators of
quality (Manning, Lime, and Hof 1996; Manning et al. 1996).
This technique can add realism to visitor assessments of al-
ternative conditions and can be used more effectively to deal
with crowding-related issues in heavily used areas. More re-
search is warranted on the application of such techniques to
ski resorts and other commercial recreation facilities.

REFERENCES

try Standards in Visitor Surveys." In Defining Wilderness Quality: The