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Mountain Biking at Tsali: An Assessment of Users, Preferences, Conflicts, and Management Alternatives

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Abstract

Tsali Recreation Area is part of the Cheoah Ranger District of the Nantahala National Forest. Overlooking the Great Smoky Mountains, it is one of the premier mountain biking sites in the Eastern United States. The results of a 13-month on-site survey of 1,359 Tsali visitors examine the demographics, behavior, current trip profile, and attitudes toward user fees, current management policies, and future management alternatives. More than 70 percent of visitors were male, 96 percent were white, 85 percent had attended college, 90 percent were between the ages of 20 and 49, and more than 60 percent had incomes over $50,000. Sixty percent of the visitors had four or more years of experience; 16 percent were beginners. Visitors averaged 21 biking trips totaling 59 days yearly, averaging 3 visits to Tsali. Fifty-five percent were first-time visitors, while 80 percent said Tsali was their "favorite place" to ride. Trail surface and congestion were the most important site attributes to visitors. Surfaces rated high in performance, indicating that management practices are successful. Congestion on trails rated slightly less than "good" suggesting management consideration. Site facilities rated "good" or better on average. Parking and security were ranked highly for both performance and importance. Toilet facilities ranked the lowest in performance but high in importance suggesting another area for management consideration. Most visitors (95 percent) agreed that fees are a "good tool to manage public recreation areas," in general and at Tsali. Visitors overwhelmingly supported future management alternatives that proposed more trail miles, even though these were combined with fee increases.

Keywords: Amenities, fee demo, importance/performance, mountain biking, recreation management, site facilities, trail attributes, user fee.

Introduction

Mountain biking is a relatively new and rapidly growing outdoor recreation activity. Preliminary estimates from the 2000 National Survey on Recreation and the Environment (http://www.srs.fs.fed.us/trends/summary1.pdf) indicate that approximately 21 percent of Americans 16 years and older participate at least once a year in off-road activities using a mountain or hybrid bike (Cordell and others, in press). Mountain biking is an activity of particular interest to many forest managers because it frequently occurs on the trails and forest roads that are also used by hikers, horseback riders, hunters, and other recreationists. However, the rise of mountain biking as a significant forest recreation activity has been so rapid that very little information has been gathered about its participants. The U.S. Department of Agriculture Forest Service (Forest Service) managers in western North Carolina recognize it as an especially important activity. The region has become nationally famous for the quality of the mountain biking experience provided on trails and forest roads. Tourism for mountain biking has risen dramatically in recent years. As a result, nearby areas have begun to implement plans to expand their mountain biking facilities, which could lead to further increases in visitation. Land and resource managers need information about use patterns, preferences, and needs of this growing market in order to properly plan facility developments that meet the needs of these customers without sacrificing quality of the natural resource base.

This influx of visitors from around the country holds the potential to serve as an important economic force in the small communities that dot the valleys of western North Carolina. However, in order to take advantage of this potential, land managers and local governments need more information about mountain bikers including their origins, trip profiles, household characteristics, on-site management preferences, and use of local area amenities. Knowing more about these bikers and their needs is essential to the development of sustainable resource management plans, which can induce economic development in the region.

This study was undertaken to gather information about mountain bike users at the Tsali Recreation Area in the Cheoah Ranger District of the Nantahala National Forest. Named after a Cherokee Indian, Tsali is considered one of the premier mountain biking venues in the Eastern United States. It is situated on a series of peninsulas jutting into Fontana Lake and overlooks the Great Smoky Mountains. The area's primary attraction is a four-loop trail system (fig. 1) totaling just under 38 miles and offering a variety of landscapes to hikers, mountain bikers, and horseback riders. In addition, the area offers dispersed and developed camping, hunting, and lake access. The primary users of the area are mountain bikers and equestrians. To accommodate the needs of these two groups, trails are managed on a rotational basis, alternating daily between mountain bike and equestrian use.

Tsali is one of a number of national forest sites where user fees have been implemented as part of the Forest Service's Fee Demonstration Project. Fees are charged for developed campsites and trail use, whereas parking, dispersed camping, and lake access are free.

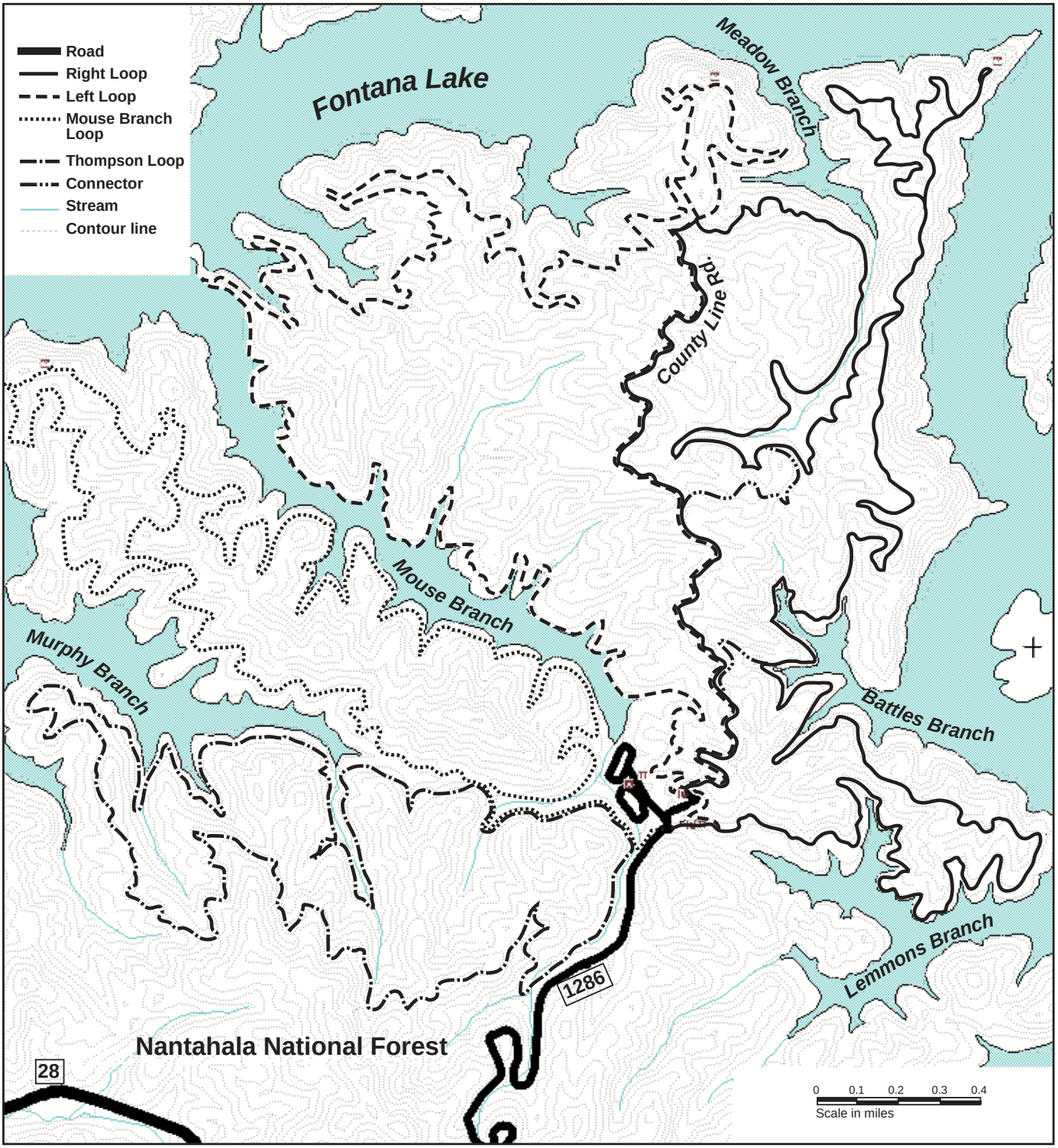

Figure 1—Map of Tsali Recreation Area and trail system.

Objectives

Balancing the ever-growing demand for mountain biking with traditional activities including horseback riding, hiking, and hunting is a challenge for managers of the area. To assist with these challenges, we focused on several major objectives.

1. Describing mountain biking participants and identifying market segments.
2. Giving managers at Tsali feedback about customer perceptions of the area's attributes, facilities, fees, and management policies.
3. Giving managers at Tsali feedback about customer preferences for future management policies, fees, and facility development.
4. Assisting local community efforts in rural economic development through tourism by providing information about spending patterns, use patterns, and sources of information pertaining to mountain biking tourists.
5. Developing estimates of the economic benefits and regional economic impacts generated by mountain bike recreation at Tsali.

This is the first of two reports addressing these major objectives. In this report, we focus primarily on the first three objectives by statistically summarizing user characteristics; current trip profiles; visitor ratings of site attributes, facilities, and management policies; visitor ratings of off-site attractions and services; and visitor preferences for future site facility development and management. The remainder of this report includes a discussion of research methods and procedures, followed by sections on household demographics, mountain biking behavior in general, a profile of the current trip, perceptions of current on-site attributes and facilities, perceptions of local area services and places of interest, perceptions of current management policies, and preferences for future facility development and management alternatives.

Research Design

Surveying at Tsali occurred on 129 days from the beginning of August 1998 to the end of August 1999. Sampling days were randomly allocated within each of the four seasons. The number of days sampled each season was based on the estimated season's share of annual use. On each of these days, trained volunteer interviewers randomly surveyed selected visitors over age 12 as they completed their day's ride at Tsali. Less than 1 percent of those approached refused to be interviewed. In all, 1,359 contacts were made.

On-site survey questions inquired about the individual's number of annual mountain biking trips, in general, and about Tsali, household demographics, preferences, and satisfactions with Tsali's facilities, as well as more information about their current recreation trip. In addition, we also asked questions about user fees, management policies, and future management alternatives. Due to the large number of questions, we ultimately used two different surveys, which were administered randomly. These surveys, versions A and B, are included in appendix A.

Visitor Demographics

The great majority of Tsali users interviewed were white males—71.5 percent overall (fig. 2); whereas 96.5 percent of visitors identified themselves as white (fig. 3). The education level reported by Tsali users was quite high. More than 20 percent attended graduate school; 40.3 percent had undergraduate degrees; and another 27.1 percent, including current students, reported having had some college education (fig. 4). Only 10 percent reported

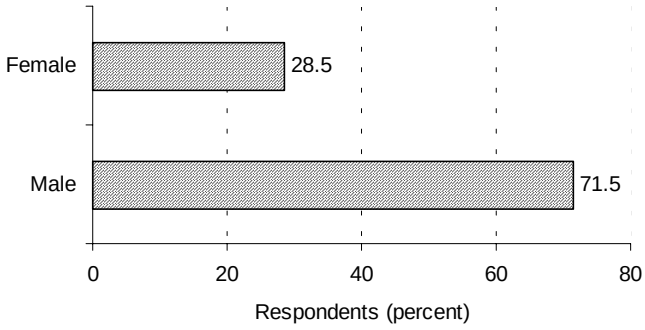

Figure 2—Percentage of respondents by gender.

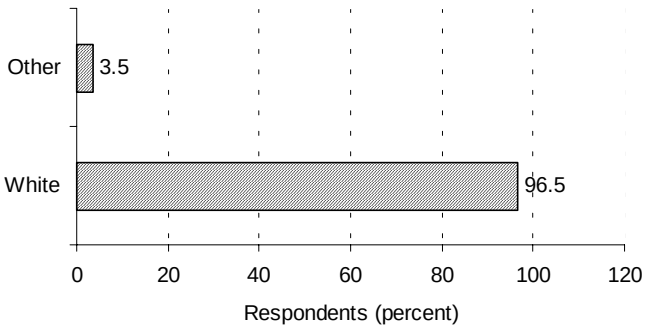

Figure 3—Percentage of respondents by race.

having a high school education or less. However, the latter group included all interviewees, and some were not yet 18 years old.

The average age of visitors surveyed was 34.1 years. Eighty percent of the visitors were between 20 and 49 years old (fig. 5). Those in the 30- to 39-year-old age group comprised the largest age cohort at 37.1 percent. Approximately 6 percent of visitors were over 50, whereas < 5 percent were under age 20. Mountain biking at Tsali does not seem to be the exclusive domain of the young because nearly 30 percent of all visitors were over age 40. About 3 percent of those interviewed reported some disability (fig. 6).

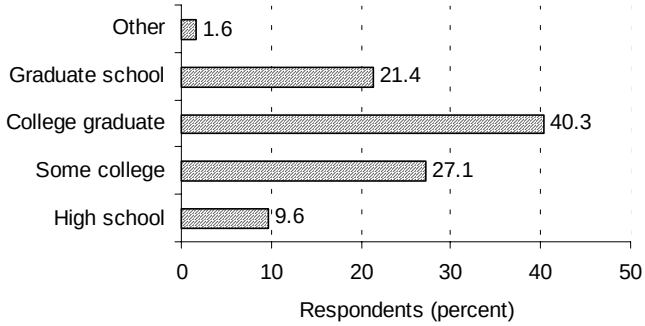

Figure 4—Percentage of respondents by education.

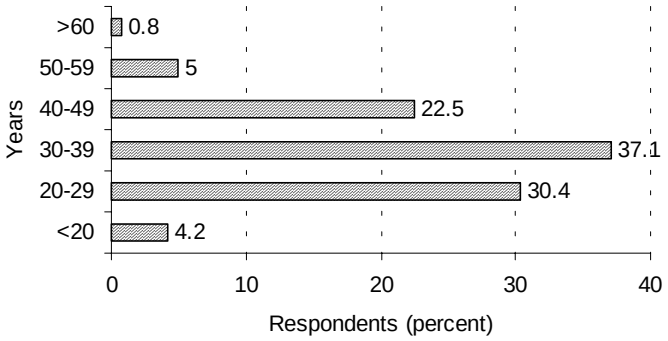

Figure 5—Percentage of respondents by age.

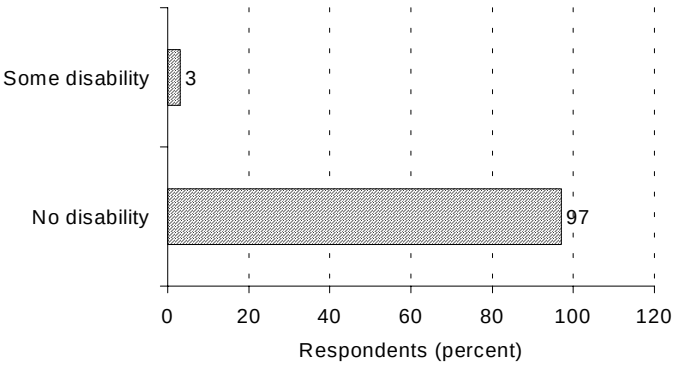

Figure 6—Percentage of respondents by disability.

Almost 70 percent of visitors came from households that had no children (fig. 7). Visitors from households composed of just two adults accounted for 38.4 percent, and individuals from single-person households made up 28.6 percent. Visitors from households of more than two adults who had no children comprised 2.4 percent. Most households with children in our visitor count also had two adults. This type of household accounted for 24.9 percent of all visitors. Only 3.4 percent of visitors reported living in single-parent households, and only 2 percent reported living in households with children and more than three adults.

Income levels also were above average. Only 14.5 percent of visitors reported household incomes below $30,000 per year (fig. 8). Not quite 20 percent came from households earning between $30,000 and $50,000 per year. Just under one-fourth (24.4 percent) lived in households where income was between $50,000 and $75,000 per year. Another one-fifth of the visitors (19.3 percent) had household incomes between $75,000 and $100,000. Almost one-fifth (17.2 percent) reported having household incomes over $100,000. Just over 6 percent of those interviewed chose not to report their household incomes.

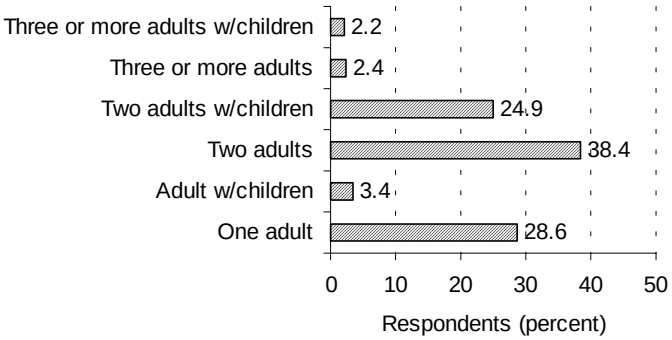

Figure 7—Percentage of households by composition.

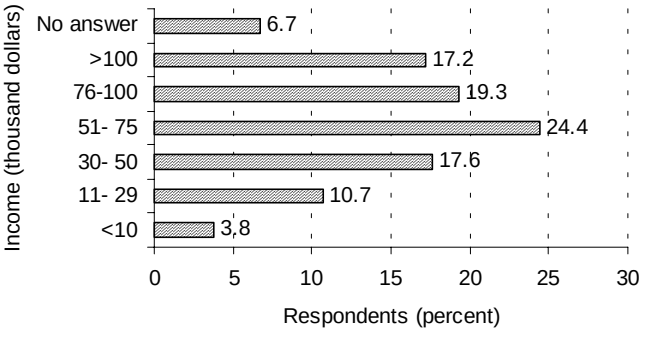

Figure 8—Percentage of respondents by income.

Although the distribution of reported household incomes ranges broadly—sizable proportions of visitors fall into the under $30,000 and over $100,000 categories—nearly 40 percent of those surveyed reported household incomes > $75,000 a year. An estimate of annual income can be obtained by multiplying the midpoints of each income category by the percentages adjusted for those who did not report income. This yields an average household income for Tsali visitors of approximately $70,000 a year.

Mountain Biking Profile

Tsali visitors have a wide range of mountain biking experience and skill levels. On average, visitors reported 5.4 years of mountain biking experience. A relatively large percentage of the visitors was new to mountain biking. Thirty-nine percent indicated that they had been mountain biking for 3 years or less (fig. 9).

In fact, up to 16.6 percent of the visitors had been active in the sport for < 1 year. Not quite one-third (31.8 percent) had participated in the sport for 4 to 6 years. Approximately 29.2 percent had been mountain biking for more than 7 years, and a third of the visitors had participated for more than 10 years.

Self-assessed mountain biking skill levels indicated that most Tsali visitors had average or above average ability (fig. 10). Less than 12 percent considered themselves below average or beginners. Slightly more than one-third (36.5 percent) felt they had average skills. Above average skill was reported by 44.2 percent of the visitors, whereas 7.9 percent claimed to be mountain biking experts.

Between August 1998 and August 1999, there was wide variety in the frequency that visitors reported participating in mountain biking. Two common measures for participation intensity in an outdoor recreation activity are days and trips. The average number of days a year over all visitors was 59.2. Five percent said they did not mountain bike a single day in the past 12 months, whereas 15.9 percent spent 9 or fewer days participating (fig. 11). At the other extreme, 39.6 percent claimed to have participated in mountain biking on at least 50 days in the previous year. Indeed, 13.3 percent of respondents said they participated in the sport on at least 100 different days.

On average, visitors to Tsali reported taking about 21 trips (traveling more than 20 minutes from home to any location) in the last year to go mountain biking. About 16 percent said they took one or fewer trips in the past 12 months (more than half of those having taken no trips) (fig. 12). Just under 9 percent reported taking more than 50 trips per year, whereas another 18.2 percent said they took between 21 and 50 trips. The largest percentage for any single category, 20.9 percent, applied to those taking two to five trips per year. Nineteen percent took 11 to 20 trips, whereas 17.1 percent took 6 to 10 trips.

Respondents indicated that, on average, they had been coming to Tsali for just over 2 years. About 50 percent said that they had been visiting Tsali for 1 year or less (fig.13).

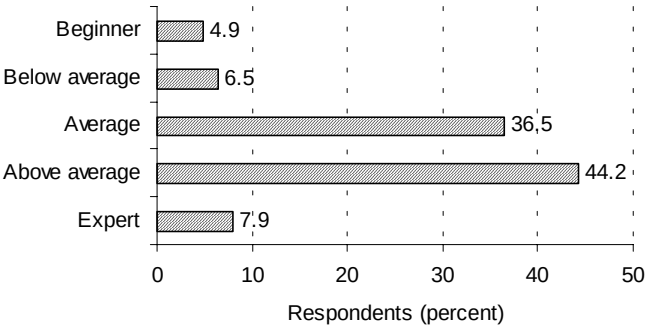

Figure 10—Percentage of respondents by skill level.

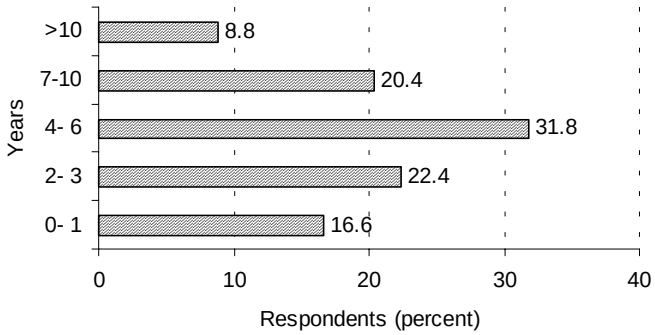

Figure 9—Percentage of respondents by experience.

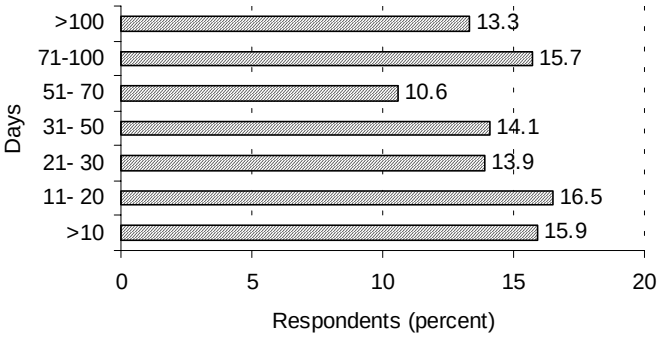

Figure 11—Percentage of respondents by mountain biking days anywhere in last 12 months.

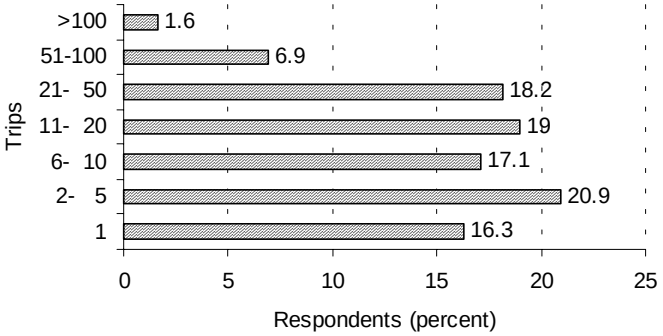

Figure 12—Percentage of respondents by trips to go mountain biking anywhere in last 12 months.

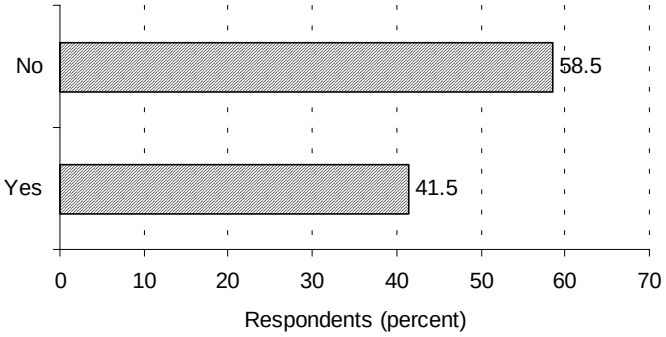

Figure 14—Percentage of respondents by first visit to Tsali.

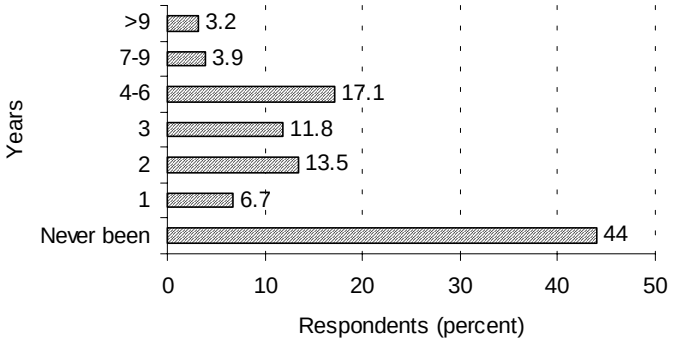

Figure 13—Percentage of respondents visiting Tsali by years.

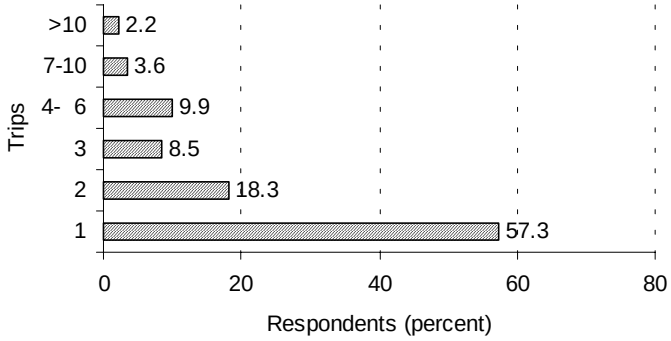

Figure 15—Percentage of respondents by trips to Tsali in last 12 months.

Most (over 40 percent) said that this was their first visit (fig.14). Just over 25 percent said they had come to Tsali for either 2 or 3 years, whereas 17.1 percent reported having visited for between 4 and 6 years. About 7.1 percent said they had been mountain biking at Tsali for 7 years or more.

Including the current trip, 55.7 percent of respondents indicated taking one trip to Tsali in the last 12 months (fig. 15). Again, most were first-time visitors. About 26.2 percent reported taking either two or three trips in the past year, whereas 10.1 percent took four to six trips. Visitors who took more than seven trips to Tsali last year comprised 6.2 percent of all respondents. The average number of trips to Tsali in the past 12 months across all respondents was just under three (2.86). For those who had visited Tsali before, the average number of trips was 4.13 for any reason and 3.88 specifically for mountain biking.

Visitors were asked what season(s) of the year they typically mountain biked at Tsali. The distribution of trips appeared to be spread evenly over spring, summer, and fall with a large drop off in the winter months (fig. 16). With respect to specific patterns, the most common response was

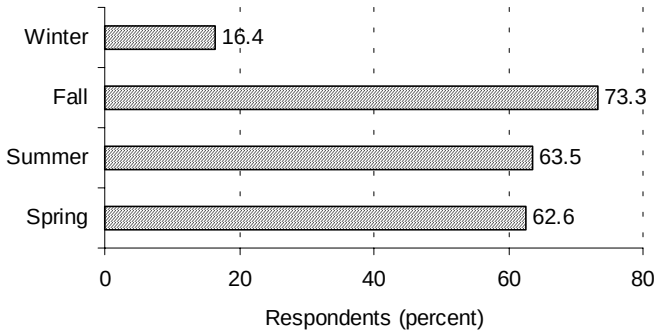

Figure 16—Percentage of respondents by seasons likely to visit Tsali.

spring, summer, and fall (23.6 percent). The next most common pattern was both spring and fall (16.5 percent). Two other patterns, summer only and all four seasons, were reported by about 13.9 percent of visitors. About 10 percent said they typically came just in the fall, and about 9.6 percent came in both summer and fall. Various other combinations of seasonal patterns made up the remaining percentage.

Including time on the current trip, respondents spent an average of 5.82 days at Tsali. The largest single category, 1 to 2 days, accounted for 35.3 percent of respondents (fig. 17). Three or four days on site in the last 12 months were claimed by 21.9 percent of respondents, whereas another 32.1 percent spent 5 to 10 days. Only 8.1 percent of respondents spent between 11 and 20 days on site last year, and fewer than 3 percent spent more than 21 days. Returning visitors spent an average of 7.88 days recreating at Tsali in the last 12 months. Dividing the average days per person by the average number of trips per person (4.13) yielded an average ratio of about 1.9 days per trip for returning visitors. For first-time visitors, the ratio was about 2 days per trip. Thus, it would appear that many people who visit Tsali do so as part of a multiday recreation trip to the area.

On average, interviewees planned to take 3.34 trips to Tsali over the next 12 months. Only 12.1 percent said they did not plan to revisit the area next year (fig. 18). Interviewees in the two largest categories, 31.1 and 25.4 percent, respectively, said they would visit once or twice next year. About 16.6 percent of visitors said they would return 3 or 4 times in the next year, 9.8 percent planned to come back 5 to 10 times, and 5 percent were expected to make more than 10 trips to Tsali.

Visitors spent, on average, 3.67 hours mountain biking. Only 2.1 percent spent an hour or less on trails (fig. 19). Slightly more, 4.1 percent, spent more than 6 hours. Over 90 percent spent from 2 to 6 hours riding, 28.9 percent spent 3 hours, and 27.1 percent spent 4 hours.

Ninety-three percent of those surveyed listed mountain biking as their main activity (fig. 20). Among the first-time visitors, over 99 percent said that mountain biking was the primary reason for their trip.

Nevertheless, 27.3 percent of all respondents reported actively engaging in other recreation activities. Rafting and floating sports comprised the most popular alternative to biking and were enjoyed by about 15 percent of all Tsali visitors (fig. 21). Hiking and camping, 9.3 and 5 percent, respectively, were the next most popular activities. Swimming, running/jogging, and fishing were next at a combined 6.3 percent.

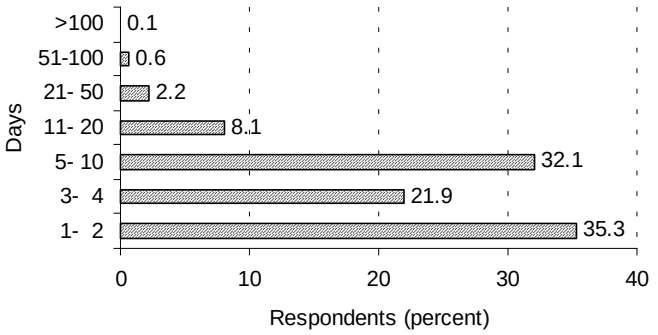

Figure 17—Percentage of respondents by days at Tsali in last 12 months.

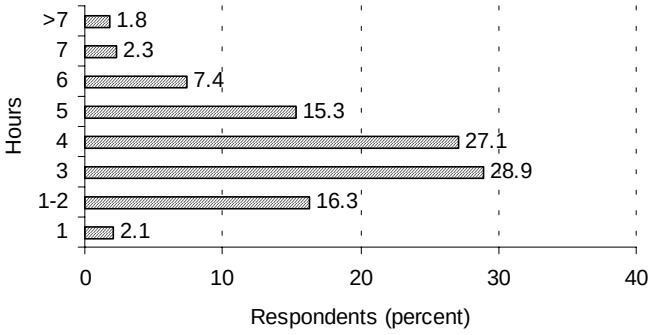

Figure 19—Percentage of respondents by hours ridden per day at Tsali.

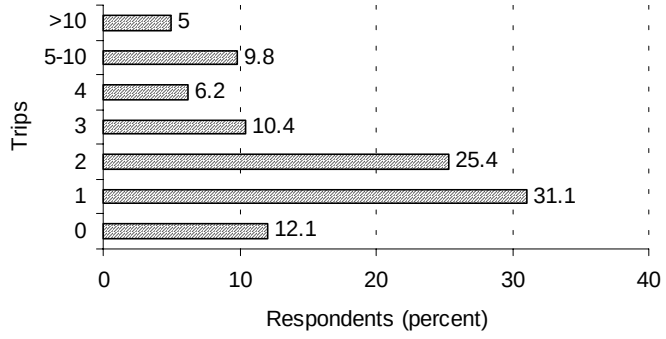

Figure 18—Percentage of respondents by planned trips to Tsali in next 12 months.

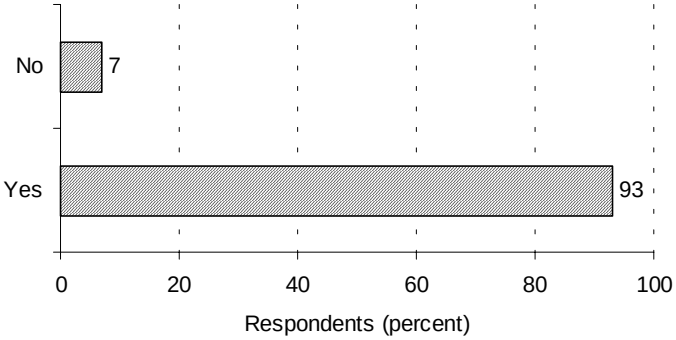

Figure 20—Percentage of respondents listing mountain biking as favorite Tsali activity.

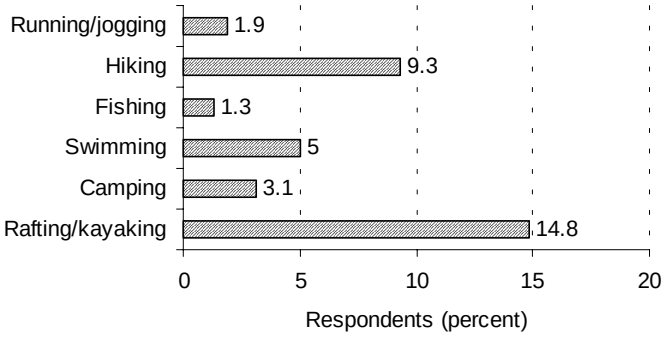

Figure 21—Types of activities at Tsali other than mountain biking.

Tsali was listed as the favorite place to mountain bike by 83.3 percent of respondents (fig. 22). However, only 5.2 percent of the respondents obtained annual passes (fig. 23). Nevertheless, these people took an average of 11.7 trips a year to Tsali for all recreation activity, including 10.7 trips a year for mountain biking. Most were single-day trips because the reported average number of days spent recreating at Tsali for this group was 13.8 per person per year.

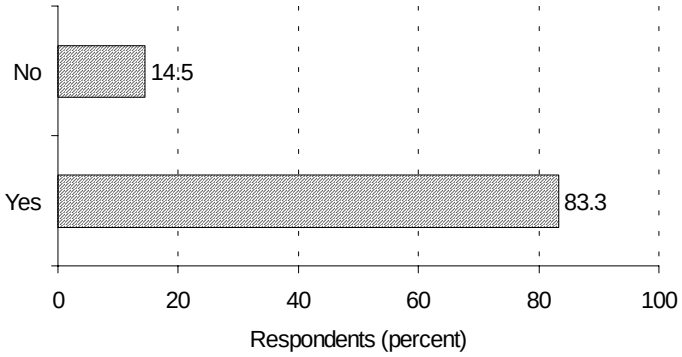

Figure 22—Percentage of respondents listing Tsali as favorite place to mountain bike.

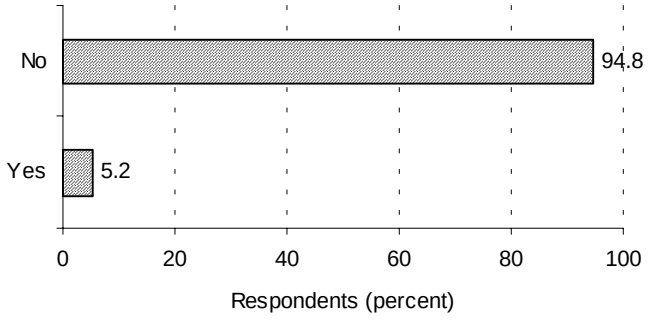

Figure 23—Percentage of respondents possessing an annual pass.

Visitors were also queried as to where they heard or read about Tsali. We asked individuals to list all such sources. The most popular single source of information, listed by 61.4 percent of respondents, was talking with friend/family (fig. 24). This source was followed by bike shops at 30.5 percent. Mass-media sources such as magazines and the Internet comprised 22.1 and 17.4 percent of information sources, respectively. However, newspapers were listed by only 1.5 percent of respondents. Tsali area businesses and chambers of commerce together were noted on about 5 percent of responses, whereas a general category of other was claimed by 8.5 percent of respondents. Only 1.3 percent of all visitors checked the public agency category.

Current Trip Profile

The current trip profile deals with information pertaining only to the present trip. For three-fourths (75.6 percent) of surveyed visitors, the Tsali Recreation Area was the primary destination for their current trip (fig. 25). For 41.5 percent of the visitors, it was their first trip. Ninety-three percent of the visitors indicated that mountain biking was their primary recreation activity while at Tsali, and over 80 percent said

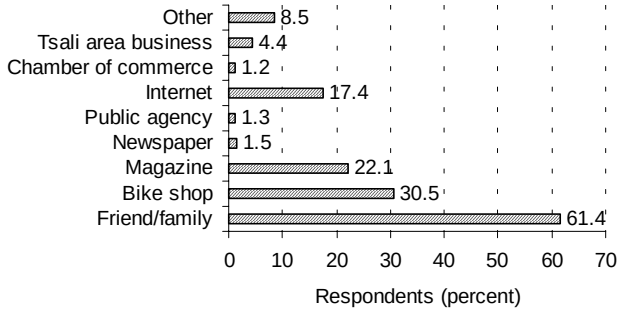

Figure 24—Percentage of respondents by information source.

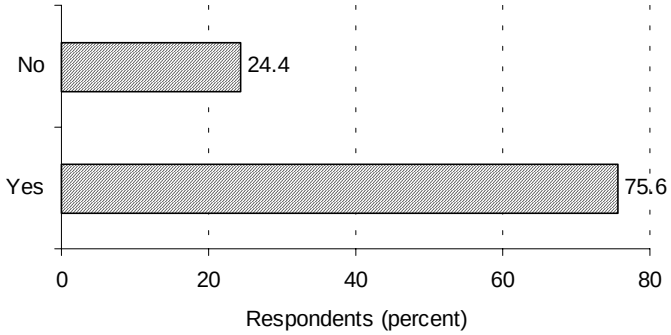

Figure 25—Percentage of respondents listing Tsali as primary destination on current trip.

that Tsali was their favorite place to go mountain biking. Only 2.8 percent of visitors said they used the services of a professional guide during their ride.

Most visitors came in relatively small groups. The largest number of respondents, 42.3 percent, came with one other person (fig. 26). About 12.8 percent of respondents came alone, whereas another 12.3 percent reported coming in a group of three. Groups of between 4 to 10 people made up 27.7 percent of the sample. Only 4.3 percent said they were in a group of more than 10 people. Not surprisingly, most visitors came with a group of friends or family. However, 3.9 percent reported coming with an organization or club.

The wide geographic appeal of Tsali is evident in the distribution of visitors' reported travel times (fig. 27). Only 8.6 percent of those surveyed said they lived within 2 hours travel time. The greatest number of people, 42.5 percent, reported being within a 2- to 4-hour drive of Tsali. This distance would include such metropolitan centers as Atlanta, Knoxville, Charlotte, Asheville, Chattanooga, Athens, and Johnson City. Another 19.8 percent of respondents lived between a 5- and 7-hour drive, whereas just over 19 percent traveled from 7 to 10 hours one way to get to Tsali. More than 10 hours of one-way travel was reported by 14.1 percent of the surveyed visitors.

Most visitors indicated that their trip involved overnight travel from home. Only 14.6 percent reported they were away from home for a day or less (fig. 28). Most (49.6 percent) said they would be away from home for 2 to 4 days. Trips lasting 5 to 7 days were reported by 20.4 percent of visitors. Trips lasting longer than a week were reported by 15.4 percent.

All visitors were asked which trails they rode on the day they were interviewed. The Right Loop received the most use among those surveyed. It is 11 miles long and primarily single-track with lake views and creek crossings. Sixty percent of respondents reported biking the Right Loop on the day they were interviewed (fig. 29). Part of its attraction is that trails are available to shorten the ride to either 4 or 8 miles. Use of the remaining trails was about equal. The Thompson Loop, which is 7.7 miles of mixed single-track and old logging roads with stream crossings and old-homesite views, was ridden by 31.9 percent of respondents.

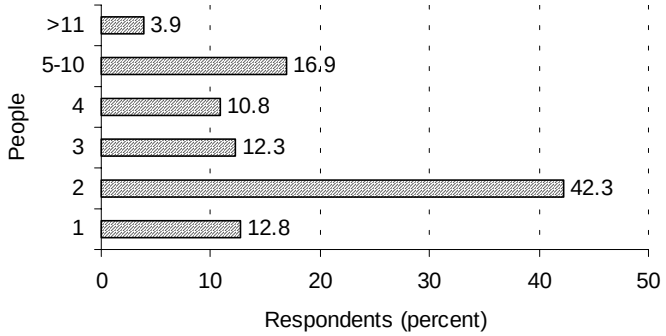

Figure 26—Percentage of respondents by group size.

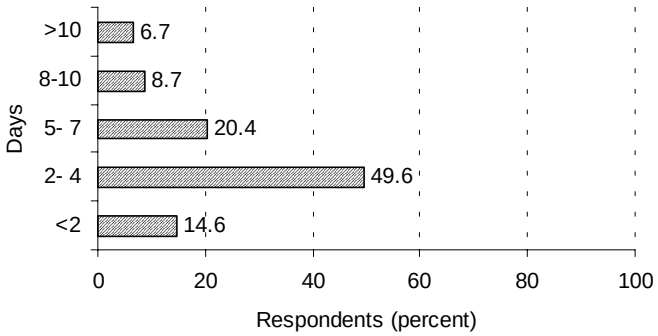

Figure 28—Percentage of respondents by length of current trip.

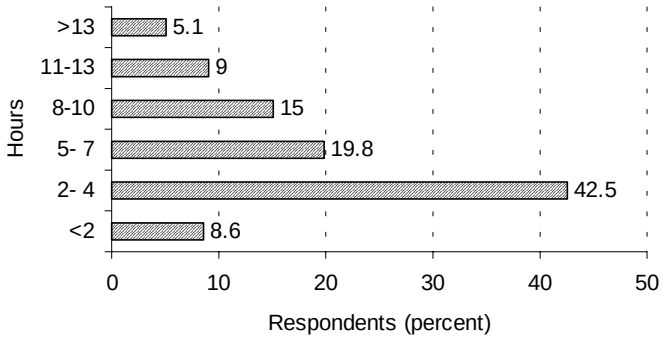

Figure 27—Percentage of respondents by one-way transit time.

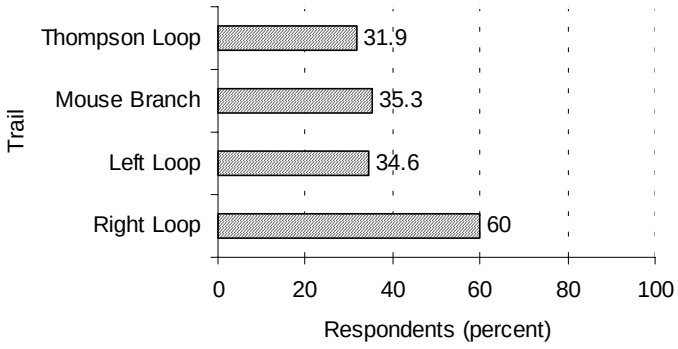

Figure 29—Percentage of respondents by trails ridden on current trip.

Mouse Branch, which is 6.5 miles of single-track and old logging roads with wildlife openings, was ridden by 35.3 percent of respondents. Finally, the Left Loop, which is single-track, 11.9 miles long, and features views of the Great Smoky Mountains and Fontana Lake, was ridden by 34.6 percent of respondents.

The trail-use question was worded to allow reporting of various combinations of trails. Nearly one-fourth (24.7 percent) of those interviewed reported biking just the Right Loop. Another 21.5 percent reported biking both the Right Loop and Left Loop. Only 8.8 percent said they rode just the Left Loop Trail. Combining the Mouse Branch and Thompson Loops was more common than biking either alone. Just over 16 percent of visitors said they rode both Mouse Branch and Thompson Loop on the day they were interviewed. By comparison, only 7.4 percent said they rode just Mouse Branch, and 4.7 percent said they rode just the Thompson Loop. The rest of the visitors reported various other combinations, and about 3 percent said they did not know which trails they rode. Hence, about 15 percent reported biking combinations of trails that are not allowed under the current horse/bike rotation system. This could indicate that visitors are violating established policy, or it may mean that some were reporting trails ridden over a multiday visit, rather than those ridden on the day surveyed.

If Tsali were unavailable for their current trip, 73.7 percent of visitors said they would have recreated elsewhere (fig. 30). Of those, 75.8 percent said they would seek an alternative location for biking. A smaller number said they would go elsewhere and participate in a different activity such as paddle sports at 7.2 percent and hiking at 6.7 percent.

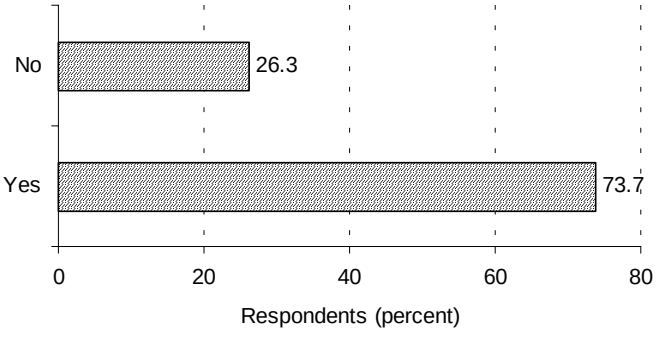

Figure 30—Percentage of respondents by those who would have recreated elsewhere if Tsali were unavailable.

Preferences and Satisfaction

In this section, visitor responses pertaining to four important aspects of the Tsali recreation experience are summarized. These include trail attributes, site facilities, area amenities, and the user fee system. Each of the aspects contains a number of dimensions. Trail attributes include scenery, signage, trail surfaces, vegetation, congestion, and the amounts of various types of trails. In addition, the horse/bike rotation system is included among trail attributes. Site facilities include toilets, parking, campsites, bike-washing area, information board, and security/safety. Area amenities include lodging, off-site public and private campgrounds, bed/breakfasts, restaurants, guide/outfitter services/supplies, gifts/crafts, shopping, and other places of interest.

For each dimension, visitors were asked to assess their satisfaction with performance and then to rate its relative importance. Combining performance and importance helps managers determine where they have met customer needs and highlights necessary improvement. Items that have high scores on both satisfaction and importance show where managers have earned a gold star; i.e., where they have performed well in dimensions that visitors find important. Any dimensions that had high importance scores and low performance ratings need increased attention. Dimensions with low importance scores and very high satisfaction ratings could be given less emphasis. For example, although parking and the bike-washing area may receive similar performance or satisfaction ratings, e.g., fair, parking might receive a higher importance rating. This information would assist managers in directing limited resources toward parking facilities' improvement.

Trail Attributes and Types

Table 1 contains trail attribute performance and importance ratings. Performance contains percentages of respondents' ratings across the four levels: very good, good, fair, and poor. For the congestion attribute, the levels from best to worst are: very low, low, fair, and high. Each of the performance levels was assigned a quantitative value evenly divided on a scale of 5 to 1. Table 1 also contains importance mean and rank of each trail attribute.

Trail scenery rated the top performance mean of 4.55, with 98 percent of respondents rating scenery as good or very good. Trail surfaces and the horse/bike rotation system ranked second and third in terms of performance with means of 4.11 and 4.06, respectively. The percent of respondents rating trail surfaces as very good or good was

Table 1—Trail attribute performance and importance

Trail attribute	Performance					
	Very good (5.0)	Good (3.67)	Fair (2.33)	Poor (1.0)	Mean	Rank
	Percent of respondents					
Scenery	68.4	29.6	1.9	0.1	4.55	1
Signage	30.7	39.8	24.7	4.8	3.62	6
Surface	42.3	49.6	7.3	.7	4.11	2
Vegetation	32.5	44.6	19.2	3.7	3.75	4
Rotation (horse/bike)	46.3	40.8	8.9	4.0	4.06	3
	Very low	Low	Fair	High		
Congestion	34.4	36.0	23.0	6.5	3.64	5

Trail attribute	Importance						
	Very important (5)	(4)	Moderately important (3)	(2)	Not important (1)	Mean	Rank
	Percent of respondents						
Scenery	35.4	33.1	25.3	3.7	2.5	3.95	3
Signage	33.5	29.9	24.7	8.0	3.9	3.81	4
Surface	43.9	36.1	16.0	2.3	1.8	4.18	1
Vegetation	21.1	31.1	31.8	8.7	7.1	3.50	6
Rotation (horse/bike)	37.8	22.9	21.7	7.9	9.7	3.72	5
Congestion	40.0	32.9	21.2	4.0	1.9	4.05	2

91.9, whereas those rating the horse/bike rotation system as very good or good were 87.1 percent. For each of these attributes, it appears that users were highly satisfied with current site conditions.

Three of the six trail attributes earned performance mean ratings of < 4. These included trailside vegetation management (3.75), congestion (3.64), and trail signage (3.62). For each of these attributes, at least 70 percent of respondents rated conditions at Tsali as either very good or good (very low or low for congestion). However, a higher percentage of respondents rated these attributes as fair or poor. Hence, it would appear that based on current performance, these latter three attributes are the more likely to require management attention than scenery, trail surfaces, or the horse/bike rotation system.

Table 1 also displays information about the relative importance visitors give each trail attribute. Importance ratings contain percentages by attribute across five levels, from very important to moderately important to not important. Quantitative values for each level were evenly divided from 1 to 5 allowing the calculation of an importance rating mean for each attribute and an overall importance rank. Survey respondents rated trail surfaces and trail congestion as the two most important attributes, with mean importance ratings of 4.18 and 4.05, respectively. These were the only two attributes that more than 40 percent of users rated very important. Moreover in both cases, close to 95 percent of interviewees rated them as at least moderately important. Signage, horse/bike rotation, and trailside vegetation management were ranked as the least important, at 3.81, 3.72, and 3.50, respectively.

Over 15 percent rated the horse/bike rotation system and trailside vegetation management as less than moderately important.

Combining the performance and importance ratings leads to some fairly clear management implications regarding trail attributes. Mountain bikers find trail surfaces and trail congestion very important. Trail surface is among the highest in terms of performance, suggesting that management practices have been highly successful. On the other hand, congestion is the second lowest ranked performance attribute. Given its relatively high importance, trail congestion is an issue that management will need to address. Problems may be compounded by the growing popularity of mountain biking in general and at Tsali in particular.

Like congestion, the horse/bike rotation system is ranked relatively high for performance but low for importance. Overall, only 12.3 percent of respondents reported any conflicts on Tsali's trails. Less than 3 percent reported conflicts with horseback riders or hunters. The most conflicts, 7.5 percent, were reported to have occurred with other mountain bikers. Mountain bikers probably experience few conflicts with horseback riders and, therefore, do not find the relatively light horse traffic to be an important issue. Managers considering increased biking demand may consider increasing the ratio of biking days to horseback riding days.

Signage is ranked lowest in terms of performance and near the bottom in importance. This suggests that bikers generally do not consider signage a major issue. Such a conclusion could be misleading. For example, return bikers probably know the various trails fairly well. On the other hand, first-time visitors may consider signage important. Because over 40 percent of those surveyed were first-time visitors, and 63.4 percent of interviewees rated signage as more than moderately important, management may find it beneficial to improve signage at the site.

In addition to evaluating the quality of trails, we asked visitors to rate the relative amounts of easy, difficult, and single-track trails. Performance and importance ratings for the various trail types (table 2) give managers information that can be useful in redesigning or constructing trails. Performance ratings of current trail types are too much, about right, or too little. Overall, it appears that the mix of trail types at Tsali is quite good, with nearly 90 percent of bikers rating the number of single-track trails as about right, and 88 percent similarly rating the number of easy trails. The only performance issue appears to be that 15.9 percent

Table 2—Trail type performance and importance

	Performance		
Trail type	Too much	About right	Too little
	Percent of respondents		
Single-track	3.0	89.6	7.3
Easy trails	4.3	87.9	7.8
Difficult trails	2.5	81.6	15.9

	Importance					
Trail type	Very important (5)	(4)	Moderately important (3)	(2)	Not important (1)	Mean
	Percent of respondents					
Single-track	41.6	23.5	26.4	6.7	1.8	3.96
Easy trails	16.8	21.4	37.1	14.7	9.9	3.20
Difficult trails	23.4	29.1	34.9	9.0	3.5	3.60

of bikers would like to see more difficult or highly technical trail mileage. The importance ratings in table 2 suggest that current users found single-track trails more important (3.96) than easy trails (3.20).

Combining performance and importance information, the percentage of riders rating the amount of difficult trails as too little is about the same as the percentage rating easy trails as very important. These results suggest that the current mix of trail types at Tsali is close to optimal. If changes are to be considered or new trail segments added, these data suggest an increase in the amount of difficult, single-track trail mileage.

Comparing importance means of trail types (table 2) to importance means of trail attributes (table 1), one sees that the importance of the amount of single-track trails (3.96) is similar to trail scenery (3.95) but less important than trail surfaces (4.18) and trail congestion (4.05). By far, the least important trail-related item is the amount of easy trails (3.20).

Site Facilities and Services

Site facilities and services include toilets, parking areas, campsites, bike-washing areas, visitor information boards, and security/safety features designed to facilitate the natural resource-based experience that Tsali visitors desire. Visitors were asked about the quality and relative importance of these facilities.

Toilet facilities at Tsali include one permanent structure adjacent to the parking area (two pit toilets). In addition, there are four flush toilets in the campground area along with separated showers. Parking facilities consist of a main lot at the trailhead with approximately 60 spaces. There is additional parking in the campground and adjacent to access roads. Overnight campground facilities have 42 individual sites. Additional constructed facilities include an information board and a bike-washing area, both at the trailhead. The bike-washing area consists of hoses with good pressure and a hanging stand.

Performance and importance ratings for site facilities and services are reported in table 3. Table 3 is similar to table 1 except that an additional column in the performance section records don't know/care responses. These responses were not used in calculating performance means.

Parking ranks first among site facilities in terms of current performance with a mean of 4.10. Approximately 90.4 percent of those surveyed indicated that parking at Tsali was either good or very good. This suggests that at current visitation rates, visitors are quite satisfied based on parking availability, proximity to trailheads, and condition of the parking area.

The second highest ranking item is security/safety with a mean of 4.07. About 77.5 percent of respondents reported security/safety to be either good or very good. Interestingly, nearly 16 percent reported don't know/care for this item. Some people may feel that given visitation levels and characteristics of current users, security/safety is not much of an issue. Although there is no regular security service, uniformed Forest Service employees and senior-citizen volunteers visit the area, particularly around trailheads and the parking lot. Their presence likely contributes to low rates of vandalism and a feeling of visitor security.

Campsite quality (3.94) and availability (3.70) ranked third and sixth, respectively, among site facility performance means. However, in both cases over 47 percent of interviewees chose the don't know/care rating, suggesting that almost half simply do not use these facilities. Of those not registering don't know/care responses, 88.2 percent rated campsite quality good or very good. Only 76.5 percent of the same subset rated campsite availability good or very good.

Trailhead features such as the bike-washing area and the information board rated performance means of 3.78 and 3.93, respectively. It appears that about 9 percent of visitors do not use the bike-washing area, and about 6 percent do not use the information board. Seventy-three percent of visitors rated the washing area as good or very good, whereas over 80 percent rated the information board similarly. Just over 15 percent rated the washing area as fair.

Clearly, the poorest performing site facility is toilets with a mean of 3.39. Although nearly 7 percent of interviewees responded don't know/care, approximately 30 percent rated the toilet facilities as fair or poor. This low rating is probably driven by the fact that only one set of toilets is available in the area between the main parking lot and the trailhead.

Importance ratings for site facilities and services are also found in table 3. Security, parking, and toilet facilities are the most important features to visitors with importance means of 4.13, 3.88, and 3.82, respectively. Campsite availability and quality, the bike-washing area, and the information board were all considerably less important, with means around 3.5. However, the similarity of the means could be misleading. For example, the campsite

Table 3—Site facility performance and importance

Site facilities and services	Performance						
	Very good (5.0)	Good (3.67)	Fair (2.33)	Poor (1.0)	Don't know/care[a]	Mean	Rank
	Percent of respondents						
Toilets	17.2	46.2	23.4	6.5	6.7	3.39	7
Parking	41.9	48.5	8.1	.8	.6	4.10	1
Campsite (availability)	18.3	22.1	7.8	4.6	47.2	3.70	6
Campsite (quality)	17.6	28.6	5.3	.9	47.7	3.94	3
Bike wash	30.3	42.7	15.6	2.9	8.5	3.78	5
Information board	30.6	52.1	10.6	.9	5.9	3.93	4
Security/safety	32.6	44.9	5.9	.6	15.9	4.07	2

Site facilities and services	Importance						
	Very important (5)	(4)	Moderately important (3)	(2)	Not important (1)	Mean	Rank
	Percent of respondents						
Toilets	32.2	33.3	23.5	5.9	5.1	3.82	3
Parking	26.5	44.5	23.2	2.4	3.4	3.88	2
Campsite (availability)	32.7	23.0	21.2	6.4	16.8	3.49	7
Campsite (quality)	31.1	28.6	17.9	9.2	13.2	3.55	4
Bike wash	19.4	35.5	30.1	9.6	5.5	3.54	6
Information board	20.9	30.9	34.1	10.5	3.6	3.55	5
Security/safety	44.5	32.8	17.0	2.7	3.0	4.13	1

[a] No value assigned to this visitor rating.

variables have higher percentage responses at the extremes—very good or not important—than either the information board or the bike-washing area. This suggests that there is a significant number of campers, and that campsite features are quite important to them, although there are also many who do not camp. Conversely, it appears that use of the bike-washing area and the information board is more general across the population of visitors, and that the means for these features are more representative of all users.

In combining performance and importance information across site facilities and services, we find some apparent issues. Parking facilities and security/safety are highly rated in both areas, indicating that management need only continue the current course. This does not imply that managers maintain the status quo but, rather, that as visitation increases, they maintain the same proportion of parking spaces to visitors. Campsite quality and availability are not important to about half of the users, but the other half finds them pretty important. It appears that the quality

of such facilities is not as important as their availability. Finally, among site facilities, management should be most concerned about toilets. Toilets are the third most important item among the seven facilities examined and rank last in terms of visitor satisfaction.

Area Amenities and Services

We asked visitors about the performance and importance of a number of local amenities and services that could complement their experience at Tsali. These included lodging, off-site campgrounds, bed and breakfasts, restaurants, guide/outfitter services and supplies, gifts and craft shopping, general shopping, and other areas of interest. Although management has no control over such things, understanding visitor preferences may foster working relationships with local governments and businesses to develop infrastructure that is vital to the Tsali experience, as well as providing potential community development.

Four amenity and service items received performance ratings averages of good (3.67) or very good (table 4). They include guide/outfitter service/supply (4.00), other areas of interest (3.93), general lodging (3.90), and off-site campgrounds (3.84). The remaining four received average

Table 4—Local area amenities and services

Area amenities and services	Performance						
	Very good (5.0)	Good (3.67)	Fair (2.33)	Poor (1.0)	Don't know/care[a]	Mean	Rank
	Percent of respondents						
Lodging	24.2	41.1	7.9	1.7	25.1	3.90	3
Campgrounds	16.6	31.8	7.0	1.1	43.5	3.84	4
Bed/breakfasts	8.7	19.8	7.4	2.1	62.0	3.57	5
Restaurants	14.3	37.7	22.2	6.9	18.9	3.31	7
Guide/outfit service/supply	28.3	35.4	7.5	1.3	27.4	4.00	1
Gifts/crafts	7.0	27.4	11.6	2.1	51.9	3.42	6
Other shopping	7.5	26.9	17.7	6.1	41.8	3.15	8
Other interest	24.1	37.2	7.0	1.6	30.0	3.93	2

Area amenities and services	Importance						
	Very important (5)	(4)	Moderately important (3)	(2)	Not important (1)	Mean	Rank
	Percent of respondents						
Lodging	28.4	28.8	20.6	9.2	13.0	3.50	2
Campgrounds	25.0	21.3	22.5	14.6	16.6	3.24	4
Bed/breakfasts	7.6	12.2	22.3	22.8	33.8	2.36	6
Restaurants	25.6	30.6	29.9	7.0	6.9	3.61	1
Guide/outfit service/supply	24.7	30.4	23.5	8.3	13.1	3.45	3
Gifts/crafts	3.6	10.7	20.9	19.0	45.1	2.08	8
Other shopping	.8	11.9	28.6	18.9	32.5	2.24	7
Other interest	19.2	23.2	30.6	12.9	14.1	3.21	5

[a] No value assigned to this visitor rating.

performance ratings below good. These items included bed and breakfasts (3.57), gifts and craft shopping (3.42), restaurants (3.31), and other shopping (3.15). Although we did not use don't know/don't care responses in calculating mean performance ratings, it is important to note that for only three items—restaurants, lodging, and guide/outfitter service/supplies— < 30 percent of interviewees marked that column.

In terms of importance (table 4), six of the eight items received mean importance scores below 3.50. This compares to only one site-facility item, campsite availability (3.49), and one trail-related item, easy trails (3.20). In fact, three local area amenity and service items had mean scores of < 3.00, indicating that, on average, visitors found them less than even moderately important. The items that Tsali visitors found very unimportant included bed and breakfasts (2.36), other shopping (2.24), and gifts and craft shopping (2.08).

Combining performance and importance marks for local amenities and services, we can report a number of observations. First, very high percentages of visitors selected don't know/don't care for various items. Second, similar high percentages in the importance columns represented ratings less than moderately important. Given this correlation, it appears that a sizeable number of visitors do not feel that many of the listed area amenities and services add much to their experience. Given the extremely low importance means for bed and breakfasts, gifts and craft shopping, and other shopping, the performance of these items probably is irrelevant. For each, more than 50 percent of respondents indicated they are less than moderately important; < 10 percent found any of them very important.

On the other hand, restaurants, lodging, guide/outfitter services/supplies, and campgrounds were important to large segments of Tsali users, as evidenced by the fact that 40 to 60 percent of respondents indicated that each item is more than moderately important. With performance rankings of 1, 3, and 4, respectively, guide/outfitter services/supplies, lodging, and campgrounds appear to respond relatively well to visitor needs, especially guide/outfitter service/supplies. However, the high importance rank (1) of restaurants combined with its low performance ranking (7) makes it very clear that better restaurant facilities in the area would be welcomed and probably used.

Preference and Satisfaction Conclusions

Looking at performance and importance ratings across trail attributes, site facilities and services, and area amenities and services, we can make a number of general conclusions. First, the most important things to most visitors are trail attributes and on-site facilities. Visitors come to Tsali first to mountain bike; ancillary and off-site activities are given relatively minor importance.

Generally, among trail attributes and site facilities and services, performance and importance ratings are highly correlative, suggesting that the things visitors find important are being done well. The only exceptions appear to be addressing trail congestion and providing sufficient toilet facilities. Although the mean performance score for trail congestion (3.64) is barely below the good rating of 3.67, both items merit management's attention. Trail congestion can be addressed either by altering the current horse/bike rotation system, or by developing more single-track trail miles. The former would come at the expense of the shrinking proportion of horse riders, whereas the latter would involve additional capital and maintenance expenditures. Toilet facilities are clearly lacking; and increasing toilet capacity near the main parking lot and trailhead would help. A more subtle finding pertains to Tsali camping facilities. About half of those surveyed said such facilities are basically unnecessary, whereas the other half said they are very important. This split resulted in relatively low importance means for these two items.

Local services and amenities are basically less important to Tsali visitors than trail attributes or on-site facilities and services. With the exception of restaurants, items in this category appear adequate. In the case of restaurants, importance rating is relatively high (ranked first in the category, mean of 3.61). Fully 56.2 percent of interviewees rated restaurants as more than moderately important. However, restaurants were the second worst performers in the category; 35.9 percent of those not responding don't know/don't care rated them fair or poor. From these data it would appear that Tsali visitors would provide a potential market for the development of improved restaurant services in the area.

User Fees, Management Options, and Stated Behavior

Because Tsali is a fee demonstration site, issues related to how visitors perceive the payment system, fee levels, and the value of provided services are all relevant to site management. Generally, mountain bikers at Tsali do not object to the idea of user fees. We asked three general questions of all survey respondents pertaining to fees as a management tool there and at other public lands, fee levels at Tsali, and the convenience of fee collection at Tsali (appendix A, questions 35, 36, and 37 in survey A and questions 8, 9, and 10 in survey B. Fees there and on other public recreation land, user cost, and the convenience of fee collection (appendix A—questions 35, 36, and 37 in survey

A and questions 8, 9, and 10 in survey B). Ninety-five percent reported that user fees could be a "good tool to manage public recreation areas." Only 1.5 percent disagreed; the remaining 3.5 percent were undecided. Most were satisfied with the fee levels. The vast majority (96.4 percent) supported their use. Most (89.4 percent) felt the current $2-per-day or $15-per-year fee level is about right although 6.9 percent felt the fees at Tsali were too low. Only 3.7 percent said the fee was too high. An overwhelming number of mountain bikers (95.5 percent) felt the current fee collection system, which consists of a locked steel drum with entry slot and envelopes with detachable permits, is convenient. Only 3 percent deemed the system inconvenient, and 1.5 percent were undecided.

We asked one subset of visitors about their willingness to accept a slight increase in the user fee (to $3 per person per day and to $20 per year), if more services also were provided. We asked them to indicate which service or set of services they would like to see for the higher fee (appendix A—questions 38 through 48 in survey A). A little more than three-fourths (76.2 percent) indicated that they would be willing to accept this fee increase for more services. Among those willing to pay for increased services, 76.8 percent wanted more trail miles. The two services next most frequently indicated were showers near the trailhead (45.9 percent) and more toilets (39.1 percent). Improving trail maintenance (28.8 percent) and trail surfaces (27.6 percent) followed. Increasing the number of campsites (23.8 percent), bike-washing areas (20.0 percent), and parking spaces (15.5 percent) were the only other improvements supported by at least 10 percent of these users. Clearly, a number of visitors wanted more than one additional service in conjunction with a fee increase. Not quite 16 percent chose only one service to improve, whereas most (57.4 percent) chose at least two from the proposed improvements listed on the survey form.

We presented a second subset of visitors with management options considered feasible for Tsali under the Forest Service's Fee Demonstration Project. One was to retain the status quo; the others involved increasing the use fee with promise of a specific set of changes (appendix A, survey B). The options were as follows:

1. Continue with present trail and rotation system while maintaining current fee structure of $2 per day and $15 per year. Fee receipts would be used to maintain existing conditions.

2. Add a new 6- to 8-mile trail loop at Tsali. This loop would be part of the existing rotation system on the Mouse Branch side and have about the same level of difficulty. Fees would increase to $3 per day and $20 per year. Fee receipts would be used to maintain trails and facilities at existing conditions and to construct and maintain the new loop.

3. Construct a 6- to 8-mile section of a long (60 to 80 miles) point-to-point trail originating at Tsali and terminating within the Graham/Swain two-county area. The trail would be of similar difficulty as current trails at Tsali. Fees would increase to $3 per day and $20 per year with the annual pass good at all trails. Fee receipts would be used to maintain trails and facilities at existing conditions and to construct and maintain a new 6- to 8-mile segment of the long trail each year until completed.

4. Construct a loop trail system at a new location within the Graham/Swain two-county area. Each year a 6- to 8-mile section of the loop system would be constructed until the new area had about the same amount of trails and conditions as Tsali. Fees would increase to $3 per day and $20 per year with the annual pass good at both sites. Fee receipts would be used to construct the trails at the new site and to maintain trails and facilities at existing conditions at both Tsali and the new site.

5. Improve nontrail facilities at Tsali. Four new showers (two male and two female) and two new bathrooms (one male and one female) would be constructed. In addition, two new dispersed camping areas would be created with room for five tent sites at each. Fees would increase to $3 per day and $20 per year with the annual pass good at both sites. Fee receipts would be used to construct the new facilities and to maintain existing trails and facilities at current conditions.

After viewing the options, interviewees were asked to rate them on a 5-point scale (5 being most preferred and 1 being least preferred). Results of the choices among options are listed in the performance section of table 5. Ratings by percentage and the mean and relative rank for each option are also listed.

Examining the means and relative ranking of each option provides a number of insights. First, option A (status quo) is the least preferred option (mean ranking 2.56). Although appreciating the existing conditions at Tsali, as evidenced by the high performance ratings for on-site entities discussed in the previous section of this report, visitors prefer changes involving moderate cost increases that add to the suite of services currently provided. This finding is consistent with findings from the first subset above, wherein more than 75 percent indicated they would accept higher fees for desired improvements.

Table 5—Management preferences and stated behavior

Management option	Performance: Most preferred (5.0)	(4.0)	(3.0)	(2.0)	Least preferred (1.0)	Mean	Rank
	Percent of respondents						
A	15.6	12.3	16.3	23.9	31.9	2.56	5
B	24.9	30.8	24.2	15.0	5.1	3.55	1
C	19.4	24.2	25.3	19.8	11.4	3.21	3
D	30.8	14.7	23.1	17.2	14.3	3.31	2
E	17.8	15.9	12.3	17.4	36.6	2.61	4

Management option	Change in trips per year: <-2	-2	-1	No change	+1	+2	>+2	Mean change	Percent change
	Percent of respondents								
A	0	0.4	2.0	80.2	8.7	5.6	3.2	.266	7.96
B	0	.4	.8	54.4	21.6	13.6	9.2	.748	22.40
C	0	.4	1.6	60.0	18.8	9.2	10.0	.652	19.52
D	0	.4	.8	56.2	23.7	10.4	8.4	.683	20.45
E	1.6	.4	.4	72.5	9.6	8.0	7.6	.422	12.63

A second obvious finding is that visitors most prefer improvements that increase trail miles. The top three options, B (new 6- to 8-mile on-site loop, 3.55), D (new area near Tsali, 3.31), and C (new linear trail system from Tsali, 3.21), all involve additions to the current inventory of trails as well as fee increases. Options A (status quo, 2.56) and E (improve nontrail facilities on site, 2.61) are much less preferred. Moreover, fully 68.5 percent rated either as their least preferred. The two options with the highest percentage of most preferred choices were option D (30.8 percent) and option B (24.9 percent). However, option B surpassed option D in overall rankings because fewer people chose it as the least preferred option, and the largest number of people chose it as the second most preferred option (30.8 percent).

We also asked interviewees about future trips. Each was asked to indicate the expected change in their annual number of trips to Tsali under the five management scenarios. Choices included a range of -3 (3 fewer trips) to no change to +3 (3 additional trips), along with the option of selecting any number outside this range (appendix A, survey B). Results are reported in table 5. For each of the options, columns 2 through 8 represent the percentage of respondents indicating the change at the top of the column. Column 2 represents anyone listing a decrease of more than 2 trips a year, whereas column 8 contains anyone listing more than 2 trips a year. In both cases, very few indicated changes exceeding an absolute value of three. Column 4 lists the percentages of interviewees indicating no expected change in their number of annual trips under the various management plans.

Under current and proposed management plans, the percentage of visitors expecting to make fewer trips to Tsali is < 2.5 percent in all cases. Those expecting to maintain their current number of trips (no change) are by far the most numerous in any given option. Under option A (status quo) and option E (nontrail improvements), 80.2 and 72.5 percent of respondents, respectively, say that they will neither increase nor decrease their number of trips. The no change percentages drop for options C, D, and B to 60.0,

56.2, and 54.4, respectively. All of these options guarantee more trail miles. For options E and A, annual trips will increase by at least one for 25.2 and 17.5 percent of respondents, respectively. However, the percentage who said they would visit Tsali at least once more per year was much larger under option B (44.4 percent), option D (42.5 percent), and option C (38.0 percent).

Column 9 contains the mean change in trips per visitor under each option. Option B yields the largest change at 0.748, whereas options D and C are close behind at 0.683 and 0.652, respectively. Once again, options that do not include trail improvements lag behind [option E (0.422), option A (0.266)]. Combining current trips with intended trips under each management alternative allows calculation of percentage change by the average user (column 10). Option B yields a 22.4-percent increase whereas options D and E yield changes of 20.45 and 19.52 percent, respectively. Options E and A provide increases of 12.63 and 7.96 percent, respectively.

A number of conclusions can be deduced from the information in table 5. First, regardless of the management plan, interviewees plan to increase their use of Tsali. Second, there is little question that mountain bikers prefer and will positively respond to changes that increase trail miles. Third, the four most preferred options (B, D, C, and E) all involved an increase in user fees, though an increase of $1 per day is insignificant in comparison to the travel expenses for the great majority of visitors. Finally, although mountain bikers are quite happy with conditions at Tsali, maintaining the status quo is the least preferred alternative.

Acknowledgments

This research project would not have been undertaken nor completed without the support and effort of Frank Findley, USDA Forest Service, Region 8; Kathy Ludlow, USDA Forest Service, Region 6 (formerly of Region 8); Janet Smith, Nantahala Outdoor Center; and Dale Wiggins, Government of Graham County. We also acknowledge the assistance of Jonathan Kind, Melissa Lacina, and Jamie Lewis, interns with the undergraduate environmental economics program, Department of Agricultural and Applied Economics, University of Georgia. Finally, we are grateful to Gary T. Green, Department of Recreation and Leisure Studies, University of Georgia, and Allan Marsinko, Department of Forest Resources, Clemson University, for their constructive comments on an earlier draft of this manuscript and to Shela Mou for manuscript preparation and graphics development.

Literature Cited

Cordell, H.K.; Green, G.T.; Betz, C.J. [In press]. Outdoor recreation 2003. State College, PA: Venture Publishing, Inc.

Appendix A

Tsali 1998–99
Mountain Bike Survey—A[1]

1. Interviewer code: _____ 2. Interview site: _____

3. Date: _____ 4. Weather: _____ 5. Trail condition: _____

6. Time:_____ 7. Survey number: _____ 8. Party number:_____

9. Race: _____ 10. Gender: _____

INTRODUCTION—Read attached statement

Have you been interviewed here since August 1, 1998? Y___ N___ If Yes, how many times? _____

TRIP PROFILE

1. Is Tsali your primary destination on this trip? Y___ N___

2. Is this your first trip to Tsali? Y___ N___ (If Yes, go to question 4)

3. How many years have you been coming to Tsali? _____ years

4. What is your residence zip code? _____

5. What was the approximate one-way transit time to Tsali? _____ hours

6. Did you begin this trip from a place other than your primary residence? Y___ N___ (if No, go to question 10)

Where did you begin this trip? 7. City: _____ 8. State: _____ 9. Zip: _____

On what date and time did you begin this trip? 10. (month-day-year) _____ 11. Time: _____

On what date and time did you arrive at Tsali? 12. (month-day-year) _____ 13. Time: _____

When will you leave Tsali? 14. (month-day-year): _____ 15. Time: _____

Will you spend more than 50 percent of your time on this trip visiting areas other than Tsali? 16. Y___ N___

What do you estimate will be your total time away from home on this trip? 17. _____ days

VISITOR PROFILE

Including this visit, how many trips have you made to Tsali in the last 12 months? 1. _____trips

What is the total number of days for all of these trips? 2. _____ days

Not including this trip, how many trips do you plan to Tsali in the next 12 months? 3. _____ trips

Is mountain biking your main activity while at Tsali? 4. Y___ N___ (if No, go to question 13)

How many years have you been mountain biking? 5. _____ years

continued

Tsali 1998–99
Mountain Bike Survey—A[1] (continued)

How many of your trips in the last 12 months to Tsali were for mountain biking? 6. _____

Regardless of location, how many days in the last 12 months did you spend at mountain biking? 7. _____ days

How many trips in the last 12 months, to any location more than 20 minutes from home, have you made to specifically engage in mountain biking? 8. _____ trips

How would you rate your skill level at mountain biking? 9. _____ (Circle one)
a. Expert b. Above average c. Average d. Below average e. Beginner

Where is your favorite place to mountain bike? 10. Tsali or area name: _____
11. Nearest city: _____ 12. State: _____

Do you regularly participate in other recreation activities while at Tsali?
13. Y___ N___ (if No, skip questions 14 and 15)

What are one or two of these activities at Tsali? 14. _____ 15. _____

Where did you obtain your information about Tsali? (Circle all that apply)
16. Friend/family 17. Bike shop 18. Magazine 19. Newspaper 20. Public agency
21. Internet 22. Chamber of commerce 23. Tsali area business 24. Other_____

Suppose Tsali was unavailable for this trip. Would you have recreated elsewhere?
25. Y___ N___ (if No, skip questions 26 through 29)

Where would you have recreated? 26. Area name: _____in
27. City: _____ 28. State: _____

What would have been the main activity? 29. _____

DEMOGRAPHIC INFORMATION

How many people, including yourself, are recreating with you on this visit? 1. _____

Which best describes the group recreating with you? 2. _____
a. Family b. Friends c. Family and friends d. Club or organized group f. Traveling alone g. Other

Did you use a professional guide? 3. Y___ N___

How would you describe your household? 4. _____
a. Single adult (no children) b. Single adult with children (under 18)
c. Two adults (no children) d. Two adults with children (under 18)
e. Three or more adults (no children) f. Three or more adults with children (under 18)

Which best describes your level of education? 5. _____
a. High school b. Some college c. College graduate d. Graduate school e. Other_____

What is your age? 6. _____ Do you have a disability? 7. Y___ N___

What interval best describes your annual household income? 8. _____
a. Under $10,000 b. $10,001 to 30,000 c. $30,001 to 50,000
d. $51,000–75,000 e. $75,001 to 100,000 f. Above $100,001 g. No answer

continued

Tsali 1998–99
Mountain Bike Survey—A[1] (continued)

Which category best describes your current main occupation? 9. _____ (Circle one)

a. Student	b. Trades	c. Sales	d. Management	e. Technical
f. Educator	g. Medical	h. Law	i. Government	j. Recreation professional
k. Retired	l. Forestry/agriculture/mining		m. Unemployed	n. Other

INFORMATION ABOUT TSALI

Which trail(s) did you ride today? (Circle all that apply) 1. a. Right Loop b. Left Loop
c. Mouse Branch d. Thompson Loop e. Don't know names

Do you have an annual pass? 2. Y___ N___

Which seasons of the year would you normally use Tsali? (Circle all that apply)
3. Spring 4. Summer 5. Fall 6. Winter

How many hours do you spend riding per day on a typical visit to Tsali? 7. _____ hours

Please rate the following trail attributes (on the trail(s) you rode today). Also rate the relative importance, on a scale of 1 through 5, of each attribute toward the overall quality of your visit to this site (for example, 1 = not important, 3 = moderately important, 5 = very important).

						Importance
8.	Trail scenery:	Very good	Good	Fair	Poor	_____
9.	Trail congestion:	Very low	Low	Fair	High	_____
10.	Trail surfaces:	Very good	Good	Fair	Poor	_____
11.	Trailside vegetation:	Very good	Good	Fair	Poor	_____
12.	Trail signage:	Very good	Good	Fair	Poor	_____
13.	Bike/horse rotation system:	Very good	Good	Fair	Poor	_____
14.	Single-track availability:	Too much	About right		Too little	_____
15.	Amount of easy trails:	Too much	About right		Too little	_____
16.	Amount of difficult trails:	Too much	About right		Too little	_____

Have you experienced any conflicts with other users at Tsali? 17. Y___ N___
(If No, skip questions 18 through 21)

Which user groups have been a source of conflict for you? (Circle all that apply)
18. Mountain bikers 19. Horse riders 20. Hunters 21. Other _____

Please rate the following site facilities as you found them on THIS VISIT. Also rate the relative importance, on a scale of 1 through 5, of having these facilities toward the overall quality of your visit to this site (for example, 1 = not important, 3 = moderately important, 5 = very important).

							Importance
22.	Toilets:	Very good	Good	Fair	Poor	DK	_____
23.	Parking availability:	Very good	Good	Fair	Poor	DK	_____
24.	Camp-site availability:	Very good	Good	Fair	Poor	DK	_____
25.	Camp-site quality:	Very good	Good	Fair	Poor	DK	_____
26.	Security/safety:	Very good	Good	Fair	Poor	DK	_____
27.	Bike-washing area:	Very good	Good	Fair	Poor	DK	_____
28.	Information board:	Very good	Good	Fair	Poor	DK	_____

continued

Tsali 1998–99
Mountain Bike Survey—A[1] (continued)

Please rate the following services found within a 25-mile distance of Tsali. Also rate the relative importance, on a scale of 1 through 5, of each service toward the overall quality of your visit to this site (for example, 1 = not important, 3 = moderately important, 5 = very important).

						Importance
29. Lodging:	Very good	Good	Fair	Poor	DK	_____
30. Other campgrounds:	Very good	Good	Fair	Poor	DK	_____
31. Eating places:	Very good	Good	Fair	Poor	DK	_____
32. Shopping	Very good	Good	Fair	Poor	DK	_____
33. Guide/outfitter services/ supplies:	Very good	Good	Fair	Poor	DK	_____
34. Other places of interest:	Very good	Good	Fair	Poor	DK	_____

The following relate to the USE FEE at Tsali and on public lands in general:
35. Use fees can be a good tool to manage public recreation areas: Y___ N___ Don't know___

36. For the current services the use fee at Tsali is (circle one): Too high About right Too low

37. Using the fee collection system at Tsali is (circle one): Convenient Inconvenient Don't know

The current use fee is $2 per day or $15 for an annual pass. Would you consider paying a higher use fee ($3 per day and $20 for an annual pass) to get more services? 38. Y___ N___
(if Yes, circle all that apply; if No, skip questions 48 through 57)
39. More trail miles 40. More parking 41. More campsites 42. More bathrooms
43. Trailhead showers 44. More site maintenance 45. Better trail surface maintenance
46. Better trailside maintenance 47. More bike-washing areas 48. Other _____

EXPENDITURE MAIL-BACK INFORMATION

We need to collect additional information about trip expenditures. This information is best compiled when the traveler has returned home and can think about the costs of the completed trip. This information is very important to site managers, local area planners, and regional planners. Would you complete a mail survey detailing your expenditures on this trip? WE WILL DESTROY YOUR ADDRESS WHEN THE STUDY IS COMPLETED.
49. Y___ N___ (if No, end interview)

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

[1] OMB approval #0597-0110.

Tsali 1998–99
Mountain Bike Survey—B[1]

1. Interviewer code: _____ 2. Interview site: _____

3. Date: _____ 4. Weather: _____ 5. Trail condition: _____

6. Time: _____ 7. Survey number: _____ 8. Party number: _____

9. Race: _____ 10. Gender _____

INTRODUCTION—Read attached statement

Have you been interviewed here since August 1, 1998? Y___ N___ If Yes, how many times? _____

TRIP PROFILE

1. Is Tsali your primary destination on this trip? Y___ N___

2. Is this your first trip to Tsali? Y___ N___ (If Yes, go to question 4)

3. How many years have you been coming to Tsali? _____ years

4. What is your residence zip code? _____

5. What was the approximate one-way transit time to Tsali? _____ hours

6. Did you begin this trip from a place other than your primary residence? Y___ N___
(if No, go to question 10)

Where did you begin this trip? 7. City: _____ 8. State: _____ 9. Zip: _____

On what date and time did you begin this trip? 10. (month-day-year) _____ 11. Time: _____

On what date and time did you arrive at Tsali? 12. (month-day-year) _____ 13. Time: _____

When will you leave Tsali? 14. (month-day-year): _____ 13. Time: _____

Will you spend more than 50 percent of your time on this trip visiting areas other than Tsali? 16. Y___ N___

What do you estimate will be your total time away from home on this trip? 17. _____ days

VISITOR PROFILE

Including this visit, how many trips have you made to Tsali in the last 12 months? 1. _____ trips

What is the total number of days for all of these trips? 2. _____ days

Not including this trip, how many trips do you plan to Tsali in the next 12 months? 3. _____ trips

Is mountain biking your main activity while at Tsali? 4. Y___ N___ (if No, go to question 13)

How many years have you been mountain biking? 5. _____ years

continued

Tsali 1998–99
Mountain Bike Survey—B[1] (continued)

How many of your trips in the last 12 months to Tsali were for mountain biking? 6. _____

Regardless of location, how many days in the last 12 months did you spend at mountain biking? 7. _____ days

How many trips in the last 12 months, to any location more than 20 minutes from home, have you made to specifically engage in mountain biking? 8. _____ trips

How would you rate your skill level at mountain biking? 9. _____ (Circle one)
a. Expert b. Above average c. Average d. Below average e. Beginner

Where is your favorite place to mountain bike? 10. Tsali or area name: _____
11. Nearest city: _____ 12. State: _____

Do you regularly participate in other recreation activities while at Tsali? 13. Y___ N___
(if No, skip questions 14 and 15)

What are one or two of these activities at Tsali? 14. _____ 15. _____

Where did you obtain your information about Tsali? (Circle all that apply)
16. Friend/family 17. Bike shop 18. Magazine 19. Newspaper 20. Public agency
21. Internet 22. Chamber of commerce 23. Tsali area business 24. Other _____

Suppose Tsali was unavailable for this trip. Would you have recreated elsewhere? 25. Y___ N___
(if No, skip questions 26 through 29)

Where would you have recreated? 26. Area name: _____in
27. City: _____ 28. State: _____

What would have been the main activity? 29. _____

DEMOGRAPHIC INFORMATION

How many people, including yourself, are recreating with you on this visit? 1._____

Which best describes the group recreating with you? 2. _____
a. Family b. Friends c. Family and friends d. Club or organized group f. Traveling alone g. Other

Did you use a professional guide? 3. Y___ N___

How would you describe your household? 4. _____
a. Single adult (no children) b. Single adult with children (under 18)
c. Two adults (no children) d. Two adults with children (under 18)
e. Three or more adults (no children) f. Three or more adults with children (under 18)

Which best describes your level of education? 5. _____
a. High school b. Some college c. College graduate d. Graduate school e. Other_____

What is your age? 6. _____ Do you have a disability? 7. Y ___ N ___

What interval best describes your annual household income? 8. _____
a. Under $10,000 b. $10,001 to 30,000 c. $30,001 to 50,000
d. $51,000–75,000 e. $75,001 to 100,000 f. Above $100,001 g. No answer

continued

Tsali 1998–99
Mountain Bike Survey—B[1] (continued)

Which category best describes your current main occupation? 9. _____ (Circle one)

a. Student	b. Trades	c. Sales	d. Management	e. Technical
f. Educator	g. Medical	h. Law	i. Government	j. Recreation professional
k. Retired	l. Forestry/agriculture/mining		m. Unemployed	n. Other

INFORMATION ABOUT TSALI

Which trail(s) did you ride today? (Circle all that apply) 1. a. Right Loop b. Left Loop
c. Mouse Branch d. Thompson Loop e. Don't know names

Do you have an annual pass? 2. Y___ N___

Which seasons of the year would you normally use Tsali? (Circle all that apply)
3. Spring 4. Summer 5. Fall 6. Winter

How many hours do you spend riding per day on a typical visit to Tsali? 7. _____ hours

The following relate to the USE FEE at Tsali and on public lands in general:
8. Use fees can be a good tool to manage public recreation areas: Y___ N___ Don't know ___

9. For the current services the use fee at Tsali is (circle one): Too high About right Too low

10. Using the fee collection system at Tsali is (circle one): Convenient Inconvenient Don't know

The recreation fee demonstration project at Tsali provides the Forest Service with an opportunity for more innovative and flexible management strategies thus allowing us to better serve the public. In order to make the best management decisions, we need your input.

Consider the following five potential management options for mountain biking at Tsali:

A. Continue with present trail and rotation system while maintaining current fee structure of $2 per day and $15 per year. Fee receipts would be used to maintain existing conditions.

B. Add a new 6- to 8-mile trail loop at Tsali. This loop would be part of the existing rotation system on the Mouse Branch side and have about the same level of difficulty. Fees would increase to $3 per day and $20 per year. Fee receipts would be used to maintain trails and facilities at existing conditions and to construct and maintain the new loop.

C. Construct a 6- to 8-mile section of a long (60 to 80 miles) point-to-point trail originating at Tsali and terminating within the Graham/Swain two-county area. The trail would be of similar difficulty as current trails at Tsali. Fees would increase to $3 per day and $20 per year with the annual pass good at all trails. Fee receipts would be used to maintain trails and facilities at existing conditions and to construct and maintain a new 6- to 8-mile segment of the long trail each year until completed.

D. Construct a loop trail system at a new location within the Graham/Swain two-county area. Each year a 6- to 8-mile section of the loop system would be constructed until the new area had about the same amount of trails and conditions as Tsali. Fees would increase to $3 per day and $20 per year with the annual pass good at both sites. Fee receipts would be used to construct the trails at the new site and to maintain trails and facilities at existing conditions at both Tsali and the new site.

continued

Tsali 1998–99
Mountain Bike Survey—B[1] (continued)

E. Improve nontrail facilities at Tsali. Four new showers (two male and two female) and two new bathrooms (one male and one female) would be constructed. In addition, two new dispersed camping areas would be created with room for five tent sites at each. Fees would increase to $3 per day and $20 per year with the annual pass good at both sites. Fee receipts would be used to construct the new facilities and to maintain existing trails and facilities at current conditions.

Please rank these options 1 to 5, with 1 being your top choice and 5 being your least preferred choice. Also, next to each ranking, indicate by circling the number how your trips to the area in a typical year would change under the listed conditions.

	Rank	Change in trips per year							
A.	_____	-3	-2	-1	No change	+1	+2	+3	Other _____
B.	_____	-3	-2	-1	No change	+1	+2	+3	Other _____
C.	_____	-3	-2	-1	No change	+1	+2	+3	Other _____
D.	_____	-3	-2	-1	No change	+1	+2	+3	Other _____
E.	_____	-3	-2	-1	No change	+1	+2	+3	Other _____

EXPENDITURE MAIL-BACK INFORMATION

We need to collect additional information about trip expenditures. This information is best compiled when the traveler has returned home and can think about the costs of the completed trip. This information is very important to site managers, local area planners, and regional planners. Would you complete a mail survey detailing your expenditures on this trip? WE WILL DESTROY YOUR ADDRESS WHEN THE STUDY IS COMPLETED
50. Y___ N___ (if No, end interview)

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Address correspondence to either co-principal investigator c/o U.S. Department of Agriculture, Forest Service, Southern Research Station, Forestry Sciences Laboratory, 320 Green St., Athens, GA 30602 or denglish@fs.fed.us.

[1] OMB approval #0597-0110.

Bowker, J.M.; English, Donald B.K. 2002. Mountain biking at Tsali: an assessment of users, preferences, conflicts, and management alternatives. Gen. Tech. Rep. SRS–59. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 28 p.

Tsali Recreation Area is part of the Cheoah Ranger District of the Nantahala National Forest. Overlooking the Great Smoky Mountains, it is one of the premier mountain biking sites in the Eastern United States. The results of a 13-month on-site survey of 1,359 Tsali visitors examine the demographics, behavior, current trip profile, and attitudes toward user fees, current management policies, and future management alternatives. More than 70 percent of visitors were male, 96 percent were white, 85 percent had attended college, 90 percent were between the ages of 20 and 49, and more than 60 percent had incomes over $50,000. Sixty percent of the visitors had four or more years of experience; 16 percent were beginners. Visitors averaged 21 biking trips totaling 59 days yearly, averaging 3 visits to Tsali. Fifty-five percent were first-time visitors, while 80 percent said Tsali was their "favorite place" to ride. Trail surface and congestion were the most important site attributes to visitors. Surfaces rated high in performance, indicating that management practices are successful. Congestion on trails rated slightly less than "good" suggesting management consideration. Site facilities rated "good" or better on average. Parking and security were ranked highly for both performance and importance. Toilet facilities ranked the lowest in performance but high in importance suggesting another area for management consideration. Most visitors (95 percent) agreed that fees are a "good tool to manage public recreation areas," in general and at Tsali. Visitors overwhelmingly supported future management alternatives that proposed more trail miles, even though these were combined with fee increases.

Keywords: Amenities, fee demo, importance/performance, mountain biking, recreation management, site facilities, trail attributes, user fee.

The Forest Service, United States Department of Agriculture (USDA), is dedicated to the principle of multiple use management of the Nation's forest resources for sustained yields of wood, water, forage, wildlife, and recreation. Through forestry research, cooperation with the States and private forest owners, and management of the National Forests and National Grasslands, it strives—as directed by Congress—to provide increasingly greater service to a growing Nation.