

**DIFFERENCES BETWEEN RAIL-TRAIL
USERS AND GENERAL TRAIL USERS OF THE
MOUNT ROGERS NATIONAL RECREATION AREA**

by

Andrew Justin Mowen

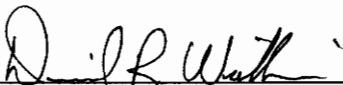
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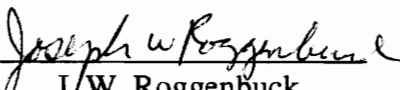
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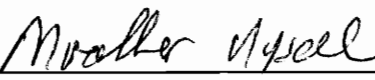
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(ABSTRACT)

Recent research has emphasized the importance of rail-trails for various activity experiences and economic benefits. Past research has not, however, examined rail-trail opportunities with other trail opportunities in order to understand whether specific management efforts are needed for this type of setting and its users.

This study investigated the differences between rail-trail users and general trail users with respect to socio-demographics (age, income, gender, income, community type), use characteristics (frequency of visitation, miles traveled to the site, group size, past experience with the area), expenditures (total and specific types), and trail/activity meanings (satisfaction, setting appraisals, place attachment, activity involvement, mode of experience).

The study included a variety of camping and day-use areas within the Mount Rogers National Recreation Area. On-site interview and mail survey data were obtained from 235 trail respondents from May through October, 1993.

Findings revealed few group differences with respect to socio-demographics and trail meanings. Use characteristics and expenditures, however, demonstrated differences as rail-trail users tended to be day-users who traveled shorter distances, participated in

trail activities for fewer hours and within smaller groups, and tended to spend more on hotel accommodations and restaurants than general trail users.

Management implications relate to assisting the economic base of local communities by attracting more non-local rail-trail users and encouraging them to stay longer in the region. Recommendations for further research suggest assessing benefits and motivations with respect to specific trail opportunities in order to reveal greater group differentiation. A discussion on the joint effects of variations in activities at the two trail settings is also addressed.

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Finally, I would like to dedicate this thesis in memory of Adam Sweet who made a brief yet significant impact on my life. He will be deeply missed.

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Chapter I

INTRODUCTION AND STATEMENT OF PURPOSE

Introduction

Demands for diverse outdoor recreation opportunities have increased over the last few decades. Recreation planners and managers are continually searching for better ways to meet this increased demand. Developing and managing a variety of settings for the purpose of outdoor recreation has been one strategy utilized to satisfy this increased and diverse demand. One particular type of recreation setting, the rail-trail, has recently gained considerable attention among public recreation managers, groups, and researchers because it offers the potential to expand outdoor recreation opportunities at a relatively low cost. As such, a thorough understanding of rail-trails is needed in order to facilitate proper management and development. This thesis introduction will begin by examining the rail-trail concept, its history, and how past research has contributed to an understanding of its users, their behavioral patterns, and associated benefits. The introduction concludes by suggesting that, while research has treated the rail-trail as a unique recreation setting, it has not compared users of rail-trails with users of other recreation settings to determine the role of rail-trails in today's current system of outdoor recreation resources. The potential benefits of such knowledge with respect to any differences are then discussed.

Rail-trails are recreational trails constructed on the rights-of-way of unused or abandoned railroad lines (Moore, 1991). Rail-trails offer the potential for considerable expansion when one considers that, during its peak, the United States' railroad network contained over 270,00 miles of tracks. This figure is six times larger than the United States' current interstate highway system (Vogelsong, 1993). Currently, however, over

125,000 miles of these railways have been abandoned (Rails-To-Trails Conservancy, 1990). Consequently, there is considerable interest in converting these abandoned railways into rail-trails.

In 1976, the rail-trail movement gained initial momentum due to the passage of the Railroad Revitalization and Regulatory Reform Act. The purpose of this particular legislation was to set aside abandoned railways to be preserved for future public use, including recreation (Vogelsong, 1993). Since the passage of this act, the number of successful rail-trail conversions has grown immensely. As of 1989, 242 trails comprising 3100 miles existed in the United States (Moore, 1991). Rail-trails were visited over 27 million times in 1988 (Rails-To-Trails Conservancy, 1989). Use levels of rail-trails, however, may vary considerably from trail to trail. Managers of 51 trails in *A Sample of America's Rail-Trails* (Rails-To-Trails Conservancy, 1988) noted that usage on their trails ranged from 1,800 user-days/year to 1,000,000 user-days/year.

Setting attributes such as flat grades, closeness to towns/cities, and relatively safe and secure environments have all helped contribute to the popularity of rail-trails. Other reasons for the increased popularity of rail-trails as cited by the Rails-To-Trails Conservancy (1990) include the following:

1. Railways are often times ideal for wildlife habitat and can help prevent serious soil erosion.
2. Railways often include or are near historical sights and structures, thus adding interest and satisfying the need for nostalgia.
3. Railways may provide an inexpensive solution for increased local recreation and tourism development because they are extant and require little excavation.
4. Railways can be ideal in connecting isolated parks in order to form a "green" network within a community or city.

Due to the increasing popularity and development of rail-trails, recreation managers and researchers are attempting to understand various issues relating to these settings. Many rail-trail studies have examined the rail-trail user in terms of socio-demographic characteristics, use characteristics and use behavior (Gobster, 1990; Furuseth & Altman, 1991; Moore, Graefe, Gitelson, & Porter, 1992). Specific socio-demographic characteristics examined have included gender, age, education level, and income. Activities or use behaviors have typically been measured through miles traveled to the trail, frequency of use, and length of stay.

Rail-trail benefits have also been investigated in terms of their individual utility (exercise and health, social interaction, nature appreciation, emotional attachments) and their economic utility (higher resale value of nearby property, increased tourism dollars into the community). Studies focusing on these rail-trail benefits have confirmed the existence of a wide variety of such individual and societal benefits (Moore, et al., 1992).

While considerable support exists for rail-trails, there are issues relating to adjacent landowner and general user conflict which have only recently been explored. Research focusing on these issues have generally found that landowner conflicts were few and that the number of trail problems for land owners either remained the same or they decreased after the trail was established (Moore, et al., 1992). Problems among trail users themselves are now being investigated as well. Moore (in press) has compiled a synthesis of various conflict issues in order to identify gaps in the current state of knowledge pertaining to multiple use trails.

Much of the rationale for existing rail-trail research is motivated by the perception that this type of setting is unique and deserves specific management attention. Rail-trail researchers, however, have yet to demonstrate that rail-trail use, user characteristics,

benefits, and meanings attached to trail use are different from other trail opportunities. The tendency to focus on high growth in vogue recreation settings is not an entirely new phenomena. Wilderness settings have been extensively examined in terms of use, user characteristics, and desired experiences since the early 1970's, yet nearby settings without the wilderness designation may exhibit similar qualities. Directing research attention to areas with specific recreation opportunities provides useful information, but it also may carry the danger of de-emphasizing other, more generalized recreation settings. It is suggested that this trend may be happening with respect to rail-trails.

Therefore, this thesis proposes that, while rail-trail research has provided managers with a wealth of setting specific information, it hasn't identified the specific role of rail-trails vis-a-vis other trail settings. More specifically, an understanding of differences in use characteristics (socio-demographics), user characteristics, expenditures, and trail/activity meanings between rail-trails and other trail settings may give outdoor recreation planners and managers insights as to the appropriateness of various marketing efforts such as promotion, facility development, and provision of additional trail use opportunities. This thesis shall investigate those differences.

Statement of Purpose

The purpose of this study is to determine if, within a comparable environment, a population of rail-trail users are significantly different from a population of general trail users in terms of socio-demographics, use characteristics, expenditures, and meanings associated with trail use.

Hypotheses

This study proposes to evaluate the following null hypotheses. They have been arranged according to socio-demographic characteristics, use characteristics, trip expenditures, and meanings or benefits associated with trail use.

Socio-Demographic Characteristics

H1: There is no significant difference in gender, age, income level, education level, household size, and community origin between rail-trail users and general trail users.

Use Characteristics

H2: There is no significant difference in first/repeat use, length of stay, number of visits in the past year, years since the first visit, activity group size, overnight stay, distance traveled to the site, and type of activity among rail-trail users and general trail users.

Trip Expenditures

H3: There is no significant difference in expenditures, either aggregate or specific, between rail-trail users and general trail users.

Meanings Associated with Activities and Settings

H4: There is no significant difference in level of place attachment, activity involvement, skill level, place importance to recreation activities, satisfaction, and mode of experience between rail-trail users and general trail users.

Delimitations

This study intended to examine a theoretical population of users of the Virginia Creeper Trail, a rail-trail, and a theoretical population of generalized trail users within the

Mount Rogers National Recreation Area. For practical purposes, however, survey populations of Virginia Creeper Trail use and Mount Rogers National Recreation trail use were examined. These survey populations included the following delimitations:

1. With respect to rail-trail use, only a portion of the Virginia Creeper Trail located within the Mount Rogers National Recreation Area was sampled.
2. With respect to other Mount Rogers trail users not contacted on the Virginia Creeper Trail, only those users who indicated that day hiking, nature hiking, backpacking, horseback riding, or off-road/on-road bicycling was their most important activity were chosen for the sample. They were categorized as rail-trail users only if they also noted that most of their time was spent on the Virginia Creeper Trail.
3. Users surveyed may have participated in their trail activity on both the Virginia Creeper Trail and other Mount Rogers trails. The ability to define and classify these users according to a particular group might therefore be limited.
4. Data collection took place during day-light hours in five month period from May through October thus results may not be representative of total yearly or daily use.

Definitions

The following definitions should be specified as they will be referred to throughout this study.

Rail-Trail- A recreation trail constructed on former railroad lines characterized by straight lines, moderate grades, a variety of surfaces, environmental surroundings, and various support facilities. Such trails have recently gained popularity among activity focused recreationists. For this study, the Virginia Creeper Trail, located within the Mount Rogers National Recreation Area, was the rail-trail of interest

General Trail Setting- A physical place used for a variety of trail activities. It is described as general due to the wide range of activities and experiences that such places may

accommodate. Examples of this setting include a variety of trails located within national, state, and local park and forest areas. For this study, Mount Rogers National Recreation Area trails were the general trail settings of interest.

Activity Involvement- A multi-dimensional concept which refers to a psychological state of arousal between an individual and recreational activities characterized by sub-components of attraction, self-expression, and centrality. Also termed by McIntyre (1990) as enduring involvement. This concept can apply to a variety of activities that occur at rail-trails and other general trail settings such as bicycling, hiking, and horseback riding.

Place Attachment- A multi-dimensional concept which refers to the extent to which an individual values and/or identifies with an external setting. It is characterized by sub-components of place identity and dependence which refer to symbolic or emotional meanings and activity influences on site preferences. Attachments may occur at both rail-trails and general trail settings.

Chapter II

LITERATURE REVIEW

This chapters reviews and discusses literature relevant to this study. It focuses on previous rail-trail studies and the importance of examining emotional attachments with recreation settings and activities. Moreover, this literature review examines rail-trail studies that have described use and user characteristics, economic and non-economic benefits, and adjacent landowner attitudes. The review continues by discussing the recent interest in studying emotional attachments pertinent to trails and trail activities. Finally, this chapter concludes by suggesting that gaps in rail-trail knowledge exist with respect to understanding differences in rail-trail use compared with use at general trail opportunities. Potential management implications of research findings are then discussed.

Use and User Characteristics at Rail-Trails

Many rail-trail investigations have examined the level and type of use at these settings as well as basic user characteristics such as socio-demographics. These variables give managers insights into who uses these trails and how they are used. Typically, previous rail-trail research has focused on one particular trail of interest rather than a variety of different rail-trails or other trail types. For example, a 1988 study specific to Wisconsin's Elroy-Sparta Trail revealed that 49% of its use came from out-of-state visitors. Distance traveled to this trail was an average 228 miles, and users were found to spend an average 1.43 nights. Approximately half the use of the Elroy-Sparta was represented by repeat users. Socio-demographically, this study revealed that a significant

amount (33%) of its users were under 18 years of age (Schwecke, Sprehn, & Hamilton, 1989).

An earlier rail-trail study at the Lafayette-Moraga trail found that the typical age ranged between 31 and 49 years of age. Approximately half the users planned to use the trail for less than a half hour and 84% of the users traveled three miles or less to reach the trail (East Bay Regional Park District, 1978).

Roggenbuck and Stubbs (1990) examined use levels as well as use and user information specific to West Virginia's Greenbriar River Trail. They estimated a use level of 3,200 visits per annum which translated to 2,600 RVDs. With respect to general use patterns, they found that 30% traveled less than five miles to reach the trail, yet some visitors did travel extended distances. The mean distance traveled was high at 115 miles. Forty percent of Greenbriar River Trail users spent an hour or less on the trail and repeat usage was a high 70%. Lone individuals made up 29% of the total while group size averaged 2.9 people per group. Socio-demographic findings of this study revealed that most users were in the 30-39 year age range. Education and incomes were high with 46% of respondents finishing college with a median income of \$35,000 per household (Roggenbuck & Stubbs, 1990).

A comprehensive study of three diverse rail-trail settings across the United States (Heritage, St. Marks, and Lafayette/Moraga Trails) included an examination of differences in use and user characteristics (Moore, et al., 1992). This study demonstrated that demographic characteristics mirrored the local population areas through which these trails passed. The mean ages of the trail users ranged from 38 to 50 years. Education and income levels were quite high for all three trails with at least 40% graduating from college at least 44% earning \$40,000 or more per year.

Other observations relating to use behaviors and patterns revealed that frequency of use per annum varied widely among the different trails ranging from an average 31 visits per annum for the Heritage Trail to an average 100 visits per annum for the Lafayette/Moraga Trail. Other study variables that differed across the trail settings included use levels, length of stay, and percentage of long distance users. More specifically, Heritage Trail users stayed an average 150 minutes while Lafayette/Moraga Trail users stayed an average 68 minutes. Respondents who lived more than twenty miles from the trail ranged from 4% to 31% (Moore, et al., 1992). Overall the findings of this study seemed to support the notion that differences do occur across rail-trail settings, yet some use and user characteristics such as local, repeat, and high frequency of use, and high education and income levels remain consistent with respect to rail-trail use.

Studies focusing on greenways should also be considered when examining rail-trail use as these recreation settings share quite a few similarities with the rail-trail setting (Moore, et al., 1992). Results based on use and user characteristics were similar to rail-trail findings since greenway users were found to be well educated with above average incomes (Furuseth & Altman, 1991). A comparison of two separate greenways (Furuseth & Altman, 1990) revealed that both user populations were similar and that most users traveled five miles or less to reach the trails.

One study relevant to rail-trail use focused on a specific activity, bicycling, at a number of rail-trail and other trail opportunity settings within the state of Illinois (Gobster, 1990). This study concluded that most trails tended to serve local/regional users and that users were well educated with high annual incomes.

Up to now, this literature has discussed research findings as they related to use and user characteristics at rail-trail or similar settings. Some findings are consistent across the different studies. Most of these studies seem to describe rail-trail users as being well

educated in their 30s to 40s with incomes at or above \$40,000 per year. Use characteristics that are consistent across a variety of rail-trail settings include high use and high levels of repeat use, a significant amount of localized use and some non-local use, and a relatively short length of stay typically of one to two hours. These rail-trail findings shall then be compared to findings of this thesis in the Discussion and Conclusions chapter.

While the previously mentioned studies assessed use and user characteristics as they related to rail-trails, they also focused on other variables or issues relevant to these settings. The psychological and economic benefits of rail-trails have been studied in order to provide support and rationale for the maintenance and increased expansion of this trail opportunity class. The knowledge of these rail-trail benefits may be more useful for management purposes than use and user characteristics because of their causality (i.e. benefits relate to why people use the trails and how the trails affect the local communities through which they pass). This literature review will now examine research findings as they relate to rail-trail benefits, both psychological and economic.

Psychological Benefits of Rail-Trails

The study by Moore, et al. (1992) identified a wide range of perceived psychological benefits among users of three diverse rail-trail settings. Here, rail-trail users emphasized benefits related to exercise, safe recreation, peace and quiet, social interaction, transportation, nature, and wildlife appreciation. This study also concluded that landowners adjacent to these rail-trails also benefited in similar ways since 90% of all landowners identified themselves as trail users. Health and fitness was the most important benefit with a mean of 6.5 for trail users and 6.1 for trail landowners on a 7 point scale.

Interestingly, community pride due to the trail was a highly ranked benefit with a mean of 5.8 for trail users and 5.3 for trail landowners (Moore, et al., 1992).

The authors of this study summarized their findings by stating that rail-trails offer the potential to fulfill many needs and benefits as opposed to other settings which only provide a single benefit to a particular special interest group. They concluded their discussion of benefits by suggesting that trail planners and advocates emphasize the entire spectrum of benefits when promoting or developing rail-trails.

Vogelsong's (1993) study of landowner attitudes toward rail-trails included an analysis of trail benefits similar to the benefit items of the previously discussed study. His results suggested that users of the Colombia MKT Nature/Fitness Trail believed open space preservation, aesthetic beauty, community pride, and health/fitness to be the primary benefits offered by this trail. He also concluded that the trail was not important for the facilitation of benefits such as business development and alternative transportation (Vogelsong, 1993).

Benefits for users of the Greenbriar River Trail have been examined in terms of important trail attributes influencing use. Findings revealed that, overall, this trail and its attributes were rated highly by its users. More specifically, this study found that restrictions on motorized use, scenic views, presence of wildlife, and quality trail maintenance were important trail attributes (Roggenbuck & Stubbs, 1990).

Economic Benefits of Rail-Trails

Rail-trails, like other recreation trails, are felt to provide economic benefits to the local and regional community as well as psychological benefits. A variety of economic impact assessments have been examined within the context of rail-trails. Research

focusing on Wisconsin's Elroy-Sparta trail concluded that, in 1973, seventy-two businesses gained gross added sales of \$295,100 as a result of trail use (Blank, 1987). A separate study of this same trail found that users spent an average of \$14.88 per person/per day. The total direct economic impact of this trail was estimated at \$1,257,000 per annum. This figure was obtained from on-site questioning during two summer months in 1988. Users responded to the total amount of money spent for the trip while in the vicinity of the Elroy-Sparta Trail (Schwecke, et al., 1989).

In 1985, Wisconsin's Sugar River Trail realized \$430,000 in user expenditures. Users spent an average of \$9.04 per person per visit. Not surprisingly, out-of-state users spent twice as much as in-state users. These results were compiled from voluntary user surveys over a span of six years (Lawton, 1986).

Roggenbuck and Stubbs (1990) studied economic impact in terms of the dollar value that recreationists placed upon the Greenbriar River Trail's current and projected ideal conditions. They found that, in its current condition, its users placed a value of \$5.38 per day. This figure translated to an annual value of \$14,009. They also found that, if ideal levels of development and maintenance were existent, the average willingness to pay resulted in \$10.48 per day with a 27% increase in usage. As a result, the estimated annual value of this trail in an ideal state would be \$34,612. The authors concluded these economic benefit observations by indicating that such ideal figures should be treated with caution since they may not be the same for all trail users and that projected use increases were based on respondents' projections as to how much their visits might increase.

Economic impact studies focusing on several rail-trails instead of one specific rail-trail have found that trip expenditures vary greatly with respect to the particular trail used and how far users traveled. More specifically, the Minnesota Department of Natural

Resources found that users traveling short distances spent an average of \$.61 while those traveling long distances spent an average of \$53.20 per day (Regnier, 1989).

The 1989 Illinois bicycle trail study conducted by the U.S. Forest Service included rail-trails in its sample. This study examined 3,400 trail users on weekends from April through October. Total trip expenditures were assessed by asking respondents to estimate how much the trip cost getting to the trail, participating on the trail, and getting back from the trail. It was found that, on average, trail users spent an average of \$2.89 per person per trip and approximately half of these users spent no money and only 2% spent over \$50.00 (Gobster, 1990).

Differences in economic impact among three rail-trails, Heritage, St. Marks, and Lafayette/Moraga, suggest that use patterns and user origins dictate the amount or level of revenue created. Moreover, trails that attracted non-local users generated the highest economic impact because their users traveled longer distances and stayed in the vicinity of the trail for longer periods of time (Moore, et al., 1992).

This particular study also performed an in-depth analysis of trail expenditures as they related to restaurant, food, retail, auto, and other expenses for each of the three trails studied. Findings revealed that overall expenditures ranged from \$3.97 per person per day to \$11.02 per person per day and that nearly all spending (84% to 94%) was done within the trail's home state. The largest types of expenditures included food and auto related purchases. These types of purchases accounted for 64% to 83% of all expenses (Moore, et al., 1992). As expected, lodging expenditures were highest for those trails attracting a higher proportion of non-local users. This study concluded that level and type of trip expenditures varied considerably depending on the trail.

Total economic impact for each of the three trails was also calculated by multiplying average estimated daily expenditures by the number of days visited per annum.

Results indicated that total expenditures ranged from \$1,243,350 to \$1,883,400 in primary economic impact dollars (Moore, et al., 1992). This particular study did not attempt to measure the secondary economic impact for those dollars circulating through the local economy as a result of primary expenditures.

The knowledge of benefits is important for managers who wish to enhance the trail qualities that users and landowners already enjoy. Understanding the economic benefits of rail-trails may help management coordinate efforts to enact the appropriate tourism attraction measures such as increasing lodging and food opportunities if increasing revenue from a non-local source is a community supported goal. The knowledge that existing rail-trails create economic revenues and that they are valued by users and nearby landowners may help trail advocates in their quest for trail support during the proposal and conversion process. The argument for trail conversions based on economic impacts becomes even stronger in those areas where traditional industries and money sources have been steadily declining.

Arguments against the development of rail-trails exist, however, and management must recognize the nature and amount of negative trail impacts. Landowner conflicts are perhaps the largest source of opposition when a rail-trail is in the conversion process. Therefore, rail-trail research has also examined the attitudes landowners have with respect to rail-trails and how those attitudes have changed over time.

Rail-Trail Effects on Adjacent Landowners

Studies focusing on landowner attitudes as they relate to rail-trails are limited, yet extant studies do provide some insights into this issue. Many studies that have focused on the issue of landowner attitudes before and after the trail conversion process have

concluded that concerns were higher before the trail developed than after the trail was converted (Mazour, 1988; Vogelsong, 1993). The Minnesota Department of Natural Resources (1980) compared landowners along proposed trails to landowners of existing trails. They found that landowners along existing trails had a more positive attitude toward the trail and experienced fewer trail related problems than landowners near proposed trails were expecting.

The effect of rail-trails on landowner property values are also an important concern for current and prospective land owners. Several research findings have shed some light on the impact that rail-trails have on property values. Landowners next to the Lafayette/Moraga trail seemed to believe that it helped or at least did not hurt property values as 48% felt that it had little or no effect and 36% felt that it had a positive effect. Moore, et al. (1992) studied landowner attitudes and real estate agents' knowledge of property value effects resulting from nearby rail-trails. Findings revealed that both landowners and real estate agents felt property values would either remain unaffected or would increase. Interestingly, this study found that nearby owners noticed a more positive effect on property values than did landowners immediately adjacent to the trails.

The current state of knowledge pertaining to use and user characteristics, economic and non-economic benefits at rail-trails suggest several rail-trail trends: a high proportion of local use with roughly half the users traveling under ten miles, a high frequency of use, small group sizes, and a large proportion of repeat users. Some variables, however, varied considerably depending on the specific trail being studied. For example, Moore, et al. (1992) found that the type of activity and amount of expenditures varied between three rail trails. More specifically, they found that walkers/joggers represented 13% to 73% of use, bicyclists represented 20% to 80%, and horseback riders represented 0% to 4%. They also found that total expenditures ranged considerably from

\$3.97 to \$11.02 per person per day. Based on these conclusions, consistent findings with respect to local user origins, a high frequency of use, small group size, and high repeat usage should be expected for rail-trail results of this thesis while few consistent results should be expected for variables such as expenditures and activity types at rail-trails. The purpose of this study is to compare rail-trails with other types of trail opportunities. An understanding of the various types of other trail opportunities; their use, user characteristics, and benefits might be then provide insights into the ways that these types of trails would differ from rail-trails.

Literature pertaining to trail use outside of the rail-trail setting has typically focused on back-country or wilderness trails. Characteristics such as length of stay, group size, age, education, and income appear to be fairly consistent across various wilderness settings (Hendee, Stankey, & Lucas, 1990). This thesis, however, assessed trail use that could have occurred in both wilderness and non-wilderness settings. Additionally, the majority of past trail research has focused on the activity of hiking although this trend is now changing with the increase of horse use and mountain biking at these general trail opportunities. General trail research has also been site specific with little ability to generalize results. Thus, because most trail research describes backcountry/wilderness settings, hikers, and are site specific, an attempt to characterize general trail users from past studies is of little utility. Past rail-trail research has, however, suggested that rail-trails attract local and more frequent use and attract different activities.

Up to now, this literature review has discussed rail-trail findings regarding use and user characteristics, economic and non-economic benefits, and landowner attitudes. The general consensus of such research is that rail-trails are a well used and valued recreation setting. Such findings show promise for the continued expansion and development of this recent recreation setting opportunity. With few exceptions, past rail-trail research has

tended to overlook affective variables that relate to individual psychological meanings and benefits. An understanding of such states is important to recreation management in that they explain why recreationists prefer specific types of managerial conditions and why they behave the way they do.

Preliminary research on psychological measures of involvement have demonstrated some differences with respect to setting and management preferences (Williams, Patterson, Roggenbuck, & Watson, 1992; McIntyre, 1990). Such measures address a level of commitment, involvement, or attachment toward an activity, place, object, situation, or group. To date research studies have only examined involvement with respect to one referent such as the activity or the place. This particular study, however, will examine group differences in levels of both affective involvement with recreation activities and affective attachment with recreation settings in order to gain insights as to how or if the two groups may be managed differently based on these variables.

Recently, Moore (1991) has provided an in-depth analysis of place attachment to rail-trails in order to provide managers with a deeper understanding of how rail-trail users value this setting. The knowledge of such attachments may in turn help managers decide how to develop facilities and environmental conditions and who to include in the decision process. Involvement with activities (as opposed to settings) has been well researched in recreation research, yet this concept has not been fully applied to the case of rail-trails. Currently, further empirical examinations of activity involvement and place attachment are needed at rail-trails and other recreation settings in order to determine their usefulness toward predicting different use behaviors, motivations, and management preferences.

This thesis will, therefore, attempt to compare levels of place attachment and activity involvement among rail-trail users and other trail users in a comparable environmental setting. The literature review will now shift its focus from rail-trail studies

to studies that have focused on the development and application of activity involvement and place attachment. Since involvement relevant to recreation activities has been well developed and researched, it shall be discussed first.

Meanings Associated with Recreation Activities: Activity Involvement

The development of an affective measure of activity involvement had its origins in both consumer behavior research (product involvement) and recreation research (specialization). This literature review will first discuss specialization and how it assessed involvement. A discussion on the application of involvement in consumer behavior research and how this knowledge has advanced our conceptualization of involvement in recreation will then be discussed.

The concept of specialization was proposed by Bryan (1977) as a means to assess a level of involvement within a particular recreation activity. He defined it as: " a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport and activity setting preferences" (p.175). In his study on patterns of fishing participation, four types of fishermen were identified: occasionals, generalists, technique specialists, and technique-setting specialists. Bryan suggested that as an individual got more involved with a particular activity, that individual would engage in particular types of behaviors in specific settings. Equipment owned and skill level would also become more sophisticated at higher levels of the specialization continuum.

Since its initial conceptualization, specialization has been applied to a wide variety of activities and settings in order to understand how users with different levels vary with respect to certain management issues such as crowding, setting preferences, and attitudes toward management actions. These results have generally demonstrated that recreation

users with varying levels of specialization tended to have different attitudes and behave differently than their non-specialized counterparts. For example, Virden and Schreyer (1988) found that highly specialized recreationists held more negative attitudes toward management practices than non-specialists. More specifically, findings indicated that the more specialized recreationists preferred an absence of rules and regulations. Management could therefore use this concept as a means to segment users and provide different activity or setting opportunities.

A criticism of the specialization concept is its tendency to focus on observable criteria such as equipment owned and behaviors exhibited (McIntyre, 1990). Bryan noted that an affective level of involvement is important at the higher end of the specialization continuum, but he eschewed studying these internal psychological states. McIntyre, however, claimed that neglecting psychological processes within a given activity would weaken the ability to understand why certain behaviors and attitudes exist. An understanding of affective states related to involvement may then be especially relevant for management in that it might provide richer insights as to what activity experiences and settings are substitutable and interchangeable with little loss of recreation satisfaction.

The specialization concept has provided a useful and easily understandable way to operationalize activity involvement, however, it is now appropriate to discuss literature pertaining to the evolution of a more affective activity involvement and how it has provided management insights. A discussion focusing on the development of involvement in consumer behavior and how recreation research has combined this knowledge with specialization will now be discussed.

The theoretical construct of involvement has had its roots in consumer behavior where consumer products were viewed as possessions that helped to overtly express internal states of an individual's self concept. The term was introduced to the marketing

field by Krugman (1965) with his study of television advertisements. The concept has undergone considerable scrutiny and development since. Kapferer and Laurent's (1985) study identified five underlying factors of product involvement: sign value, risk importance, risk probability, hedonic values, and interest. These categories refer respectively to the perception of self-expression from product class (how a product helps express who the individual is or aspires to be), the perceived importance of negative consequences of purchase, the probability of negative consequences of purchase, the pleasurable enjoyment/reward resulting from purchase, and the product's centrality or importance to self. The key consequence of this research was the conclusion that involvement is a multi-dimensional concept best designated and described by multiple items, rather than a single measure.

Recognizing that situations and activities as well as objects or possessions were an important reflection of the self, Gunter and Gunter (1980) combined degree and type of investment in activities/situations with time and freedom of choice. They arrived at an involvement measure ranging in a continuum from high involvement (engagement) to low involvement (disengagement). They also identified four different modes of leisure experience based on their level of involvement. This research has advanced the understanding of involvement by suggesting that involvement consists of sub-dimensions and that involvement has enduring characteristics with respect to an identification with a specific activity or situation.

Several recreation studies have incorporated consumer behavior conceptualizations of involvement with specialization to overcome some the limitations of relying on observable behavior and measures (Wellman, Roggenbuck, & Smith, 1982; McIntyre, 1990). For example, the work of Selin and Howard (1988) addressed what they termed "ego-involvement" as a multi-faceted concept which varied in level of centrality,

importance, pleasure, interest, and self-expression sub-dimensions. These sub-dimensions will be defined later in this section when the work of McIntyre (1990) is discussed. Selin and Howard described such "ego-involvement" as a latent unobservable state making measurement and application difficult but not entirely impossible. Finally, they suggested that specialization could be the result of an affective involvement concept.

Studies focusing on commitment, which is arguably identical to the concept of involvement, have also recognized the importance of affective or emotional involvement over the behavioral and cognitive measure of recreation specialization. Buchanan (1985) defined commitment as:

"the pledging or binding of an individual to behavioral acts which result in some degree of affective attachment to the behavior and which produce side-bets as a result of behavior." (p. 402).

This commitment process and state is very similar to the specialization concept in that they both contain a continuum of importance, centrality, and social affiliations in order to arrive at a level of personal meaning ascribed to an activity (McIntyre, 1990 p. 29). Like Selin and Howard (1988), Buchanan stated that commitment is not a part of recreation specialization. Rather, specialization was an overt, observable manifestation of a more affective commitment (Buchanan, 1985).

Within the field of consumer behavior research, Houston and Rothschild (1978) defined involvement as, " the perception that the product is related to centrally held values, those defining one's singularity, identity, one's ego" (p. 84). McIntyre (1990) has applied this involvement conceptualization toward the recreation situation and incorporated several elements or sub-dimensions within his involvement framework (importance, enjoyment, self-expression, and centrality). Results indicated that enduring

involvement occurred with respect to the recreation experience, and this involvement consisted of three basic sub-dimensions: attraction, self-expression, and centrality. Attraction referred to a basic level of affect which tapped into feelings of activity importance and enjoyment. Self-expression and centrality were higher levels of affect that assessed how activities were a part of the individuals self-image and how central activities were to individuals' lifestyles, respectively.

McIntyre studied the implications of these three involvement sub-dimensions as they related to recreation setting choice. His findings indicated that the centrality sub-dimension discriminated on two of the three campgrounds studied while neither self-expression nor attraction exhibited any discrimination between the three campgrounds. In a related study, McIntyre (1990) tested whether users clustered according to sub-dimension types held different motivational attributes. Results indicated that "self-expressive" campers were more likely to focus on the biophysical attributes relating to goals of solitude, peace and quiet, and escape while "centralized" campers focused on activity goals relating to escape and relaxation. "Attractive" users tended to rate exploration as one of the most important motivational attributes.

While the activity involvement concept has been extensively analyzed with respect to recreation, our knowledge of attachments to recreation settings remain relatively unexplored and unapplied in empirical research. Recent research, however, suggests that this construct may be as useful as activity involvement since the setting is ubiquitous in the recreation experience (Williams, et al., 1992). Preliminary findings with respect to place attachment in recreation research shall now be examined.

Meanings Associated with Recreation Settings: Place Attachment

Schreyer, Jacob, and White (1981) defined place attachment as the valuation of a recreation setting consisting of functional meanings and emotional meanings. Proshansky, Fabian, and Kaminof (1983) arrived at the conclusion that people can identify with places, while Stokols and Shumaker (1981) concluded that people may also be dependent on places for a variety of functional reasons. Research by Williams and Roggenbuck (1989) assessed the combination of place identities and place dependencies in a measurement of place attachment. Findings revealed that place attachment does consist of place identity and place dependence. Place identity refers to the extent to which a place is a central part of a person's life. Place dependence refers to the extent to which a person is attached to the setting because it is able to facilitate activity experiences.

Qualitative research by Mitchell, Carroll, Force, and McLaughlin (1993) has stressed the importance of identifying constituents' affective attachments to recreation settings in order to make more sensitive and well-grounded management decisions. This research involved interviewing users, managers, and adjacent landowners of a river drainage area. Study objectives were to develop a typology of users based on respondents' rationale for using the recreation setting. Based on collected qualitative information regarding the nature of recreation setting attachments, they arrived at a two level typology describing the recreation visitor as being attachment oriented (where the place itself was as least important a reason for coming to the area as the activities pursued) and user oriented (where the importance of the setting was tied more to activities and their outcomes rather than the resource itself) (Mitchell, et al., 1993, p. 33). This study seemed to confirm the quantitative research of Williams and Roggenbuck (1989) regarding the existence of two place attachment sub-dimensions, identity and dependence, except that

place identity was included as part of an attachment orientation while place dependence was labeled as a periodic user within the user orientation profile.

With regard to the specific case of rail-trail settings, Moore (1991) explored the nature of place attachment, its component dimensions, and identified the variables associated with the various attachments formed at these trails. His findings validated that place attachment and its sub-components do exist at rail-trail settings and these attachment sub-components, dependence and identity, were significantly related to users' education level household incomes, and particular trail of use.

Moore also pointed out that the more specialized rail-trail users are more dependent on this site for their activity participation. This observation suggests that specialization or activity involvement is somehow related to place attachment. An understanding of an affective involvement with activities at rail-trails may also then be useful with respect to emotionally sensitive management decisions. While Moore (1991) has examined place attachment at rail-trails and its relationships with use and user characteristics, he didn't examine levels of a psychological or emotional involvement with trail activities. This thesis will include an examination of both place attachment and activity involvement between users of rail-trails and other trail opportunity settings.

Summary

This literature review has discussed rail-trail studies that have examined use, user characteristics, benefits, effects on landowners, and emotional meanings. It has contended that, while a considerable amount of information has been collected with respect to rail-trails, this information hasn't been compared concurrently with other general trails in a comparable environment. In order to help management decide whether to manage

differently for this emerging trail setting, information regarding group differences of various trail opportunities is needed.

This review has also demonstrated that recent research has begun to emphasize the importance of differentiating users based on affective measures of involvement with respect to recreation settings and activities. The review examined two constructs of emotional meanings, activity involvement and place attachment, as they related to rail-trails and other recreation settings. The recent application of place attachment at rail-trails suggests that further inquiry based on levels of both place attachment and activity involvement may be helpful toward developing the current state of knowledge specific to rail-trails. Past rationale for rail-trail development would suggest that rail-trail users are more likely to visit frequently and live in neighboring communities.

This thesis shall compare of rail-trail users and general trail users with respect to user characteristics (socio-demographics), use characteristics, trip expenditures, and meanings associated with trails and activities in order to demonstrate differences between rail-trails and other trail opportunities for the purpose of providing marketing and management insights.

Chapter III

METHODOLOGY

This chapter describes research methods and is divided into four sections. The first section deals with the study area. The second describes data collection procedures. The third area covers the survey instruments used. The final section discusses statistical methods used to analyze the data.

The data for this study were obtained from a comprehensive research project conducted at the Mount Rogers National Recreation Area. Funding was provided by the U.S. Forest Service. Research objectives for the larger project included gathering information pertaining to current users, use patterns, economic expenditures, and preferences for management. The project involved data collection from May through October, 1993 and included sampling sites such as campgrounds, day-use areas, parking areas, and several hiking and rail-trail access points.

The Study Area

Data for this thesis compared users of the Virginia Creeper Trail with users of other National Recreation Area trails contacted at locations within the Mount Rogers National Recreation Area such as Beartree Campground, Elk Garden, and Hurricane Campground. All respondents in this sample who participated in trail activities within the National Recreation Area were selected for analysis. Both user groups are Mount Rogers trail users. For the sake of clarity, however, the groups will be identified as Virginia Creeper Trail users (rail-trails users) and Mount Rogers trail users (general trail users). The Virginia Creeper Trail is a rail-trail partially situated within the

boundaries of the Mount Rogers National Recreation Area. The entire trail stretches for 34 miles from the town of Abingdon, Virginia eastward to the North Carolina state line. A rural trail that runs through rolling pasture and then winds through forested areas, the Virginia Creeper Trail parallels Straight Branch Creek and offers scenic views from the many trestles that transverse this stream. The surface is a combination of dirt and cinder throughout most of the National Recreation Area. Approximately half the trail lies with the Mount Rogers National Recreation Area and is managed by the U.S. Forest Service. Local civic and recreation groups manage the other half westward from Damascus to Abingdon. All non-motorized trail use is permitted including horseback riding, bicycling, cross-country skiing, and walking/running.

The Mount Rogers National Recreation Area, named for Virginia's highest peak, includes over 115,000 acres of National Forest Land available for public use and enjoyment. Its location in the mountainous regions of Southwest Virginia helps make it an excellent setting which to enjoy a variety of outdoor experiences ranging from hiking, auto touring, and developed to primitive camping. Sampling locations for generalized Mount Rogers sites included both day-use areas and campgrounds. Sites ranging from the developed Beartree and Grindstone Campground to the more primitive Hurricane Campground are examples of specific sampling locations. Examples of day-use sampling sites included the Elk Garden parking area, Whitetop Mountain, and Beartree Lake. An adjacent State Park, Grayson Highlands, was also sampled as it exhibited attributes similar to other Mount Rogers sites. Users of these sites were assigned to the Mount Rogers trail use group only if they noted that hiking, bicycling, or horse use was their most important activity.

Three specific sampling points were chosen for interviewing trail users along the Virginia Creeper Trail. These places included an information center in downtown

Damascus (The Caboose), a vehicle parking lot along Route 58 (adjacent to Straight Branch Creek), and a rest area (The Green Cove Station Museum). These sites were chosen because they were the main entrance/egress points and because they were spread evenly throughout the Mount Rogers section of this rail-trail. Trail access points outside the Mount Rogers National Recreation Area were not sampled in this study. Therefore, results may not be representative of all Virginia Creeper Trail users. The Virginia Creeper Trail is similar to the variety of other rail-trails found nationwide because it has typical rail-trail attributes. These attributes include characteristics such as straight lines, flat grades, wide passage ways, and a variety of access points.

Data Collection Procedures

This study utilized both a brief on-site interview and a mail survey. Users within a randomized time block were stopped and asked to participate in the study. Those who agreed to participate provided answers to a few short questions. These questions dealt with trip variables and requested the respondent's address for the purpose of mail-back follow-ups. To increase response rates, respondents who completed both surveys were included in a lottery for a \$50.00 U.S. Savings Bond.

A mail survey was finally given to respondents to be completed and returned after the completion of the visit. The total interview time lasted from four to six minutes per respondent, and the mail-back survey required approximately thirty minutes to complete. Postcard reminders were sent out 10 to 15 days after the initial on-site contact. Participants who did not respond within one to two weeks of the postcard mailings were then sent a second copy of the questionnaire with a cover letter explaining the importance of their participation. As a final request, a postcard

reminder was sent in order to encourage participation among previous non-respondents. This method is an adaptation of the Dillman Total Design Method (Dillman, 1978).

Due to the broad scope of the project, the mail surveys included information pertaining to a wide range of issues for management of the Mount Rogers National Recreation Area. The response rate for Virginia Creeper Trail users was 66.0% for a usable sample size of 101. The Mount Rogers trail use sample was determined by identifying those who did not use the Virginia Creeper Trail and who identified hiking, horseback riding, or bicycling as their most important activity. The response rate for Mount Rogers trail users was not determined as there was no way to discern respondents' most important activity unless they returned the mail survey. However, the overall response rate for the larger parent project was 62%. The usable sample size for the Mount Rogers trail use sample was 134. Table 1 summarizes how the groups were contacted and assigned according to sampling location and strata.

The author and several other research assistants from Virginia Tech selected and interviewed the sample. The interviewers contacted as many trail users that they were able to during a time block randomly assigned to a given weekday/weekend in a particular month. Specific sample times and locations along the Virginia Creeper Trail and at other spots within the Mount Rogers National Recreation Area were chosen in a systematic way to obtain as representative as possible a sample of users. In this frame, there were five different sampling schemes. Four of these schemes contained the three Virginia Creeper Trail sampling sites as summarized in Table 2 at the end of this chapter.

Sampling locations were assigned to one of five time blocks. Each block included a three day time period and was designed to minimize travel distance between sampling locations. Each block occurred twice each month (during a weekend and a

weekday). Sampling on the Virginia Creeper Trail and other Mount Rogers locations involved 2.5 hours per site. Sampling schemes #1 and #2 yielded 10 hours of Creeper Trail sampling while schemes #3 and #4 yielded 20 hours (Table 2). Total Virginia Creeper Trail sampling time for each month was 60 hours. Total Virginia Creeper Trail sampling time for the entire study was 240 hours. Sampling schemes #1 and #2 yielded 30 hours of other Mount Rogers sampling while schemes #3 and #4 yielded 20 hours. Sampling scheme #5, which did not contain Virginia Creeper Trail Use, yielded 12.5 hours. Mount Rogers sampling for the larger study was 112.5 hours per month. Total Mount Rogers sampling for the entire study was 550 hours.

Only persons at least sixteen years of age were included in the sample and, at the Virginia Creeper Trail, only non-campground users were initially interviewed in order to eliminate possible double sampling of overnight campers within the other sampling frame. This process was dropped after a month, however, in order to achieve a quota of Virginia Creeper Trail users. Also, if an average of less than five Virginia Creeper Trail contacts per site occurred each month, additional sampling time was allowed at that site for weekends in the following months. This over-sampling of weekends was followed despite the heavier use that occurred during those days in an attempt to meet a quota of approximately 150 contacts for the entire Virginia Creeper Trail sample size. Data collection started in mid May, 1993 and ended in mid October, 1993. Weekday sampling at the trail ended after Labor Day weekend because the amount and extent of recreation user contacts was not predicted to be cost effective. Weekend sampling, however, continued until October 17th.

Instrumentation

A copy of both on-site trail contact forms and the mail survey instrument are provided in Appendices B, C, and D respectively. These instruments were used to assess socio-demographics, use characteristics, trip expenditures, and trail/activity meanings. Level of place attachment to the Virginia Creeper Trail was measured using a 25-item version of the place dependence and identity scale developed by Williams and Roggenbuck (1989). These place attachment items were chosen because they contain the highest factor loadings from previous research. This 25-item scale had an acceptable reliability (Alpha = .98). Respondents indicated how they felt about statements by circling a number from 1 through 5 which corresponded to values ranging from Strongly Disagree to Strongly Agree. Statements such as "I identify with this place" (place identity) and "I can't imagine a better place for what I like to do." (place dependence) represented some of the statements that were be used.

Activity involvement was measured by using a battery of 13 questions measuring individuals' meaning of a recreation activity. These statements were adopted from McIntyre's study on enduring involvement where a multi-dimensional instrument containing dimensions of attraction, self-expression, and centrality was developed (McIntyre, 1990). For this study, the author chose those same items of enduring involvement except that an additional item measuring centrality was added in order to balance the representation of the sub-dimension items. The Alpha reliability of the overall activity involvement instrument was acceptable at .87.

Respondents rated these involvement items using a five point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). Involvement items relating

to activities such as bicycling, horseback riding, and hiking included the following statements found in the mail-back survey: "This activity says a lot about who I am," "I find that a lot of my life is organized around this activity," and "I enjoy discussing this activity with my friends."

Other independent variables measured by this study included socio-demographics (gender, age, education, community residence), use characteristics (first/repeat visit, local/non-local use, activity hours, type of activity) expenditures (aggregate and specific) and other trail/activity meanings (satisfaction, expertise level, mode of experience). These variables included a combination of both interval (i.e. age, education, activity hours, place) and categorical (i.e. gender, community residence, mode of experience) variables.

Economic expenditures were measured in a variety of ways. First, overall expenses were obtained by asking respondents to indicate the dollar amount spent on every trip related expense from the time they left home until the time they returned home. Specific expenses on a variety of trip related variables were also assessed. Here, respondents were asked to indicate the amount that they spent on restaurants, food and beverage in retail stores, other retail purchases, camping fees, hotel accommodations, auto expenses, and other fees. Respondents were asked to indicate the amount spent on each of these items within two different zones. Zone A included the area on the border of and within the Mount Rogers National Recreation Area. Zone B included the areas outside Zone A, but within and along Interstates 77 and 81 within Virginia. Respondents were asked to indicate how expenditures were paid (i.e. shared expenses, paid for own expenses, paid for other expenses). Group size and length of stay were also controlled for with respect to all expenditure types. A more thorough discussion of these controls is explained in the results chapter of this thesis.

Setting and activity meanings were assessed through respondents rating, on a numeric scale, how they felt on an eclectic variety of attributes such as: Place attachment, activity involvement, quality of the visit, Mount Rogers compared to other similar settings, how the trip met, exceeded, or fell short of expectations, expertise level, the worthwhile-ness of the visit, and the importance of Mount Rogers to activities. Mode of experience was the only meaning variable that was categorical in nature. This item asked respondents to indicate whether the place itself, activities at the place, spending time with companions were the most important reason for the visit.

Treatment of the Data

The recreation setting class was the dependent variable for statistical analyses. Setting class was divided into Virginia Creeper Trail use and Mount Rogers trail use. Socio-demographic characteristics, use characteristics, trip expenditures, and trail/activity meanings were the independent variables. Chi-square analysis, Cramer's V and t-tests were used to test the hypotheses for differences in socio-demographics, use characteristics, trip expenditures, and trail/activity meanings between the two trail user groups. Chi-square and t-test analysis was performed according to the nature of the data. Cramer's V, which measures the strength of a relationship, was chosen over the phi coefficient because most chi-square tables had more than two rows and two columns. Cramer's V was then used because it keeps the strength of the relationships between zero and one. All analysis was carried out using the Statistical Package for the Social Sciences (SPSS PC+) software.

Table 1: Respondents by Sampling Locations and Strata

| Group Assignment | Virginia Creeper Trail Locations | Day-Use Locations | Overnight Camping Locations |
|------------------------------|----------------------------------|-------------------|-----------------------------|
| Virginia Creeper Trail users | 97 | 1 | 3 |
| Mount Rogers trail users | 1 | 29 | 101 |
| Non-trail users | 0 | 63 | 189 |

Table 2. Selected Sampling Sites and Times for Mount Rogers Recreation Use

| Numbered Schemes | Friday/Monday | Saturday/Tuesday | Sunday/Wednesday |
|---------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Sampling Scheme #1 | Beartree Camp 6:00-8:30P | Grindstone 7:30-10:00A <i>Green Cove</i> 11:00-1:30P Weaver's Store 3:00-5:30P Fox Creek 6:00-8:30P | Hurricane 7:30-10:00A Elk Garden 11:00-1:30P |
| Sampling Scheme #2 | Hurricane 6:00-8:30P | Fox Creek 7:30-10:00A Elk Garden 3:00-5:30P Grindstone 6:00-8:30P | Beartree Camp 7:30-10:00A Weaver's Store 11:00-1:30P <i>Green Cove</i> 11:00-1:30P |
| Sampling Scheme #3 | Raccoon Branch 6:30-8:30P | <i>Straight Branch</i> 9:00-11:30A Whitetop 3:00-5:30P Grayson Highlands 6:00-8:30P | Beartree Day 9:00-11:30A <i>Caboose</i> 3:00-5:30P |
| Sampling Scheme #4 | Grayson Highlands 6:00-8:30P | <i>Caboose</i> 8:00-10:30A Beartree Day 3:00-5:30P | Raccoon Branch 7:30-10:00A Whitetop 11:00-1:30P <i>Straight Branch</i> 3:00-5:30P |
| Sampling Scheme #5 | Hussy Mountain 6:00-8:30P | Raven's Cliff 8:00-10:30A Byllesby Dam 2:00-4:30P | Comer's Rock 9:00-11:30A Hale Lake 1:00-3:30P |

(Virginia Creeper Trail Sites are denoted in *italics*)

Chapter IV

RESULTS

Reporting results of this study shall be organized around tests of the study hypotheses. All hypotheses tested differences of study variables between the two groups (Virginia Creeper Trail users and Mount Rogers trail users) through t-tests or chi-square analyses. In each case, the specific hypothesis is reviewed and results of the appropriate statistical tests examined. For the sake of convenience, tables summarizing the results are presented at the end of this chapter.

A total of 856 users of the Mount Rogers National Recreation Area were contacted and agreed to participate in an on-site interview. A total of 528 surveys were returned for an overall response rate of 62%. Of these respondents not contacted on the Virginia Creeper Trail, 134 noted that a trail activity was their most important activity in the Mount Rogers National Recreation Area and 101 were classified as users of the Virginia Creeper Trail.

Respondents were asked numerous questions about socio-demographic characteristics, use characteristics, economic expenditures, and meanings associated with trail use which relate to the study hypotheses. Statistical analyses of these responses are summarized in following sections.

User Characteristics

Hypothesis #1: There is no significant difference in gender, age, income level, education level, household size, and community origin between rail-trail users and users of a general trail setting.

Gender comparisons between Virginia Creeper Trail users and Mount Rogers trail users were analyzed through use of chi-square analysis and Cramer's V. The chi-square test reveals no statistical differences in gender (chi-square = .36, sig. = .366)(Table 4). There are also no significant differences with respect to income levels between these two groups as demonstrated by a chi-square value of .311 (sig. = .989) as shown in Table 4.

Age, education level, and household size were measured interally. T-test analyses were, therefore, appropriate. Results show no significant age differences between these two groups with a t-value of .88 at a .38 level of significance (Table 5). There is a significant difference in education level among the two groups as demonstrated by a two-tailed t-value of 2.57 at the .01 level of significance (Table 5). More specifically, Virginia Creeper Trail users exhibit a significantly higher level of education with a mean of 15.9 years when compared with Mount Rogers trail users whose mean was 14.9 years.

There is no significant difference with respect to household size between the two groups (t-value = -1.03, sig = .30). Household size is an average of 2.7 people at Virginia Creeper Trail user households and 2.9 people at Mount Rogers trail user households.

Finally, the type of community that respondents resided in at the time of the interview was assessed. Here, classes of community types included: farm/ranch, small town, town, small city, and large city (Table 6). Chi-square analysis indicates that significant differences are present (chi-square = 14.13). More specifically, there is a higher proportion of Mount Rogers trail users residing on a farm/ranch and in a large city (21.2% vs. 10.1% for farm/ranch and 28.0% vs. 17.2% for a large city). Virginia Creeper Trail users tend to be associated with residence in towns and small cities. Both groups seem to exhibit the same percentage of respondents who indicated that they resided in small towns. The strength of these associations are moderate with a Cramer's V of .247.

Use Characteristics

Hypothesis #2: There is no significant difference in first/repeat use, length of stay, number of visits and visits the past year, years since the first visit, activity type, group size, distance traveled to the site, and overnight use among rail-trail users and users of a general trail setting.

Results pertaining to whether respondents were a first time or repeat user revealed no significant differences between the two groups. The chi-square value of 1.05 (sig. = .31) and Cramer's V of .067 supports this conclusion (Table 7). Overall, both groups seem to have high proportions of repeat users (81.2% for the Virginia Creeper Trail and 75.6% for Mount Rogers trail use).

Group size is significantly different between the two populations (t-value = -2.66) at a .01 level of significance (see Table 10). Mount Rogers trails use occurs in larger groups than Virginia Creeper Trail use. This is demonstrated by a mean group size of 3.45 people at the Virginia Creeper Trail and 4.75 people at Mount Rogers trails.

T-test analyses of miles traveled and number of total visits between the two groups indicate that there are no statistically significant differences (t-value = -.70, sig. = .48) and (t-value = 1.49, sig. = .14) respectively, yet the different standard deviations of the means (see Table 10) seem to indicate that the distributions may be different with respect to these variables. Therefore, various categories of mileage and total visits were examined through chi-square analyses (Table 8 and Table 9 respectively).

Results with respect to miles traveled indicate that a higher percentage of Virginia Creeper Trail users seem to travel short distances (less than 30 miles), while a higher percentage of Mount Rogers trail users travel mid to long range distances (61 to 150 miles). Extended travel distances seem to be equally represented between the two groups

as 19.2% of Virginia Creeper Trail users and 26.4% of Mount Rogers trail users traveled 151 or more miles. The chi-square value, 15.12, for these associations is significant at the .00 level. Cramer's V calculates to .260 (Table 8).

Chi-square analysis of total lifetime visits to the Mount Rogers National Recreation Area reveals no significant differences in this variable for the two trail user groups with a chi-square value = .453 at a .93 level of significance (Table 9).

The number of visits to the Mount Rogers National Recreation Area within the past 12 months was also measured as a means to assess a more recent frequency of visitation. Results from this t-test analysis as summarized in Table 10 demonstrates group differences with respect to frequency of visits in the past 12 months (t-value = 2.91, sig. = .01). Specifically, Virginia Creeper Trail users visit the Mount Rogers National Recreation Area more frequently than do Mount Rogers trail users with averages of 7.4 visits per annum and 2.9 visits per annum respectively.

Analysis with respect to length of time engaged in activities was determined by assessing the number of hours spent in the respondents' most important activity. Results demonstrate that there is a significant difference in activity hours between the two groups (t-value = -2.74, sig. = .01). Mount Rogers trail users seem to spend more time in their trail activity with a mean of 14.6 hours compared to a mean of 8.86 hours for Virginia Creeper Trail use (Table 10).

Type of activity was also examined between the two trail user groups. Results indicated that Virginia Creeper Trail users tended to be bicyclists and Mount Rogers trail users tended to be horseback riders. Because findings reveal significantly different activity types between the two trails, a further elaboration of this difference and how it may affect results shall be further examined at the end of the hypotheses results section.

Length of association was measured through assessing the number of years since respondents' first visit to the Mount Rogers National Recreation Area. There is no significant difference in length of association between the groups (t -value = .76, sig. = .45). Virginia Creeper Trail users have an average length of association of 8.7 years while Mount Rogers trail users have an average length of association of 7.9 years (See Table 8).

Chi-square analysis also reveals differences among the two groups with respect to an assessment of overnight use vs. day use. Users of Mount Rogers trails are more likely to stay overnight in the Mount Rogers area on their trip while Virginia Creeper Trail users are more likely to be day-users. Seventy-two percent of Virginia Creeper use was day-use while eighty-one percent of Mount Rogers trail use involved an overnight stay. Table 11 summarizes these results with a chi-square value of 65.82 at a .00 level of significance. The strength of this relationship is strong with Cramer's $V = .530$.

Trip Expenditures

Hypothesis #3: There is no significant difference in expenditures, total and specific, between rail-trail users and other trail users of a general recreation setting.

Differences in aggregate and specific types of trip expenditures were assessed by asking respondents to indicate the amount that they spent individually, or the amount of shared expenses they paid while on the trip. Initial expenditure results indicated that Mount Rogers trail users spent more per visit, however, group size and length of stay were not controlled for. Because expenditures can be a function of length of stay and group size, variations in group sizes and lengths of stay were then accounted for so that a final analysis of group differences would be based on one unit of expenditure: dollars spent per person per day.

More specifically, if respondents indicated that they paid for the expenses of others, the costs of the various trip expenses for those individuals were divided by the number of people paid for so that expenditures per individual could be assessed. For example, respondents paying \$40.00 on total expenses for themselves and one other person would result in \$20.00 of total expenses for that respondent.

An additional control beyond the control of group size addressed differences in length of stay. This study found that Virginia Creeper Trail users spent an average .30 nights in the Mount Rogers area while Mount Rogers trail users spent an average 2.73 nights. A value of one was added to each of these figures so that an average number of days stayed could be assessed. In order to calculate expenditures on a per day basis, Virginia Creeper Trail expenses were divided by the average length of stay of 1.3 days and Mount Rogers trail users were divided by an average length of stay of 3.73 days.

While this method provided a simple way to control for length of stay it also carried the assumption that spending one night involved spending two whole days at a location. Visitors, however, may arrive in the evening, stay overnight, and leave the next day during the mid-afternoon. The method employed by this thesis would indicate that these people spent two days when, in terms of hours, they only stayed one day. Study results with respect to expenditure differences should therefore be considered while keeping this limitation in mind.

Expenditure variables were measured intervally and t-tests were employed to detect differences among specific expenditure types. Results of total trip expenditures do not reveal significant differences between the two trail groups (t-value = 1.65, sig. = .10). Even though not statistically different, Virginia Creeper Trail users have higher expenditure averages per individual per day than do Mount Rogers trail users with a mean of \$49.20 vs. \$31.30 (Table 12).

A more detailed investigation into specific expenditure types asked respondents to indicate the amount that they spent on expenses such as: restaurants, food/beverage in retail stores, retail purchases excluding durable equipment purchases, lodging, gas and automobile expenses, fees at other attractions or for other entertainment, and all other expenses. Respondents were asked to divide their trip expenses according to what they spent in the Mount Rogers National Recreation Area (Zone A) and what they spent inside and along the I-81 and I-77 corridor (Zone B). Analysis was first performed on the combination of zone expenditures in order to gain an assessment of total regional expenses. Further analysis looked at expenses in Zone A and Zone B separately in order to detect any differences patterns by zone.

Even though there were no statistically significant differences found with respect to total expenditures, the two trail user groups could spend more money on certain types of expenses (Table 13). Analysis of specific expenses throughout the entire region reveals that Virginia Creeper Trail users tend to spend more on restaurants than Mount Rogers trail users with a t-value of 2.89 (sig. = .01). Virginia Creeper Trail users spend an average of \$9.10 per person per day while other Mount Rogers trail users spend an average of \$2.20 per person per day. Virginia Creeper Trail users also spend more on hotel accommodations than do Mount Rogers trail users with means of \$6.90 and \$.50, respectively (t-value = 2.99, sig. = .00). No differences with respect to purchases in retail stores, camping fees, gas/oil, auto repairs, parking fees, and other expenses were found.

The different zones which were combined in the previous analyses appeared to provide different service/amenity opportunities. For example, Zone A has a higher number of campgrounds thus it may offer more opportunities for camping while Zone B has a higher number of hotel/motel accommodations thus possibly providing more opportunities for hotel accommodations. One might then speculate whether these

expenditure findings would be similar if the different zones were assessed separately. This examination will now be discussed.

Differences in expenditures between groups with respect to purchases made in the Mount Rogers National Recreation Area (Zone A) and in the I-81/I-77 (Zone B) corridor are not as strong as the combination of zones yet patterns of differences still follow the same basic trends as both zones exhibit significant differences on the same types of expenses as the combination of zones. With regard to zone to zone comparisons, stronger differences between the two trail user groups are found within the interstate corridor (Zone B). For example, expenditures on restaurants and hotels are higher in the I-77/I-81 corridor for Virginia Creeper Trail users (Tables 14 and 15). Again, this finding is not surprising when one considers the possibility that a higher amount opportunities for hotel accommodations, restaurant dining, and automobile services exist in this zone. Conversely, camping expenses were less in Zone B than in Zone A. Differences between the trail users with respect to camping expenses in both zones are not statistically different as demonstrated by a t-value of $-.41$, sig. = $.68$ (Zone A) and $.02$, sig. = $.98$ (Zone B).

Activity and Setting Meanings

Hypothesis #4: There is no significant difference in level of place attachment, activity involvement, skill level, place importance to recreation activities, satisfaction, and mode of experience between rail-trail users and other trail users of a general recreation setting.

For the purpose of this study, several questions were utilized to assess meanings associated with the Mount Rogers area and trail activities. Some of these measures tapped well developed and frequently researched measures of meaning such as satisfaction

with the overall quality of visit, a comparison of the area to other sites, a comparison of the area to expectations, and whether the trip was worth the time and effort. Analysis reveals that there are no statistical differences in these basic satisfaction measures between Virginia Creeper Trail users and Mount Rogers trail users (Table 16).

Other measures of related to the meaning of the visit addressed levels of activity involvement and place attachment with activities and the setting. On these measures, the two study populations are also not statistically different. Level of expertise (skill level) and the importance of Mount Rogers to the most important activity have significance levels of .11 and .80, respectively. Place attachment and activity involvement comparisons between the two groups revealed no differences as well. Place attachment has a t-value = -.29 (sig. = .77). Activity involvement comparisons had a t-value = -1.84 sig. = .07.

The most important reason for visiting Mount Rogers National Recreation Area was assessed by asking respondents to indicate whether they went to Mount Rogers because they enjoy the place itself, because its a good place to do the outdoor activities they enjoy, or because they want to spend more time with companions. Differences in these modes of experience between the two groups were analyzed through a chi-square analysis. Results indicate that significant differences do occur between the two groups with respect to mode of experience. More specifically, a higher proportion of Virginia Creeper trail users indicate an activity focus, while a higher proportion of other Mount Rogers trail use indicated a place focus. The group focus seems to include the smallest proportion of both user groups with 3.0% of Virginia Creeper Trail use and 6.9% of Mount Rogers trail use (Table 17). The chi-square value of this relationship is 22.72 with a significance of .00.

The Effect of Activity Type

As previously mentioned, Virginia Creeper Trail users and Mount Rogers trail users contained different types of activity users. Virginia Creeper Trail users are more likely to be bicyclists while Mount Rogers trail users are more likely to be hikers and horseback riders. Approximately 60% of Mount Rogers users are hikers and a considerably high proportion (80%) of Virginia Creeper Trail users are bicyclists (chi-square = 114, sig. = .00, Cramer's V = .71)(Table 18). Mount Rogers trail users also contain a larger proportion of horseback riders (29%) when compared to Virginia Creeper Trail users (9.4%). These activity findings are likely to have profound implications for management as many of the differences between trail groups may also be driven by the type of activity as well as the nature of the trails themselves. In order to further explore the implications of activity type toward the findings of this study, an examination of the differences in some select study variables as they relate to type of activity is necessary.

Results from analyses based on activity type indicate that many of the previously discussed differences between trails also occur as a result of activity type. For example, 42% of hikers come from large cities and 51% of horseback riders come from farms/ranches (See Table 19). Since these two activity groups represent 90% of Mount Rogers trail use, the tendency for Mount Rogers trail users to come from these polarized types of communities is evident based on the collective effect of both the type of trail and the type of activity. Other activity differences as they relate to certain use, user characteristics, and meanings are further summarized in Table 19. In consideration of the preceding discussion, managers should be aware that there is a strong interaction between the activity and the trail setting. Results of this study are then useful to the extent that

managers consider the collective roles of activities and different trail opportunities toward the various management recommendations.

Summary

The study variables revealed some significant differences between the two trail user types. There were considerable differences in use characteristics and specific types of expenditures while there were few socio-demographic and trail/activity meaning differences between the two user types. Of all socio-demographic variables, only community type and education level were significantly different between Virginia Creeper Trail users and other Mount Rogers trail users. Likewise, meanings associated with the setting and its activities were also similar except that the most important reason for the visit varied with respect to both the place and activity orientation.

While aggregate trip expenditures were not different between the two groups, differences of specific expenditure types were found with respect to hotel accommodations and restaurant purchases. Virginia Creeper Trail users spent, on average, more than other Mount Rogers trail users with respect to these variables in each zone and the combination of zone areas.

Differences found with respect to use characteristics included: activity group size, length of stay, miles traveled, and frequency of use within the past 12 months. Mount Rogers trail users seemed to have a larger group size and they seemed to spend more hours in their most important trail activity. A significantly higher proportion of Virginia Creeper Trail users traveled the shortest distances to get to the site, while other trail users seemed to traveled mid to high range mileage. An equal proportion of each group traveled extended distances (150 or more miles). Frequency of use within the past 12

months was the final use difference studied. Results indicated that Virginia Creeper Trail users visited their trail more frequently than other trail users in the Mount Rogers National Recreation Area.

This section concluded by examining differences in activity type between the two trails. Results suggested that a different activity dominated each of the two trails. A further examination of the relationships between activity types and certain study variables led to the conclusion that differences found with respect to this thesis are also driven by activity differences between the two trails. Finally, a summary table of study findings as they related to the hypotheses is included at the end of the tables section of this results chapter (Table 20).

Table 3. Chi-Square Analysis of differences in gender between Virginia Creeper Trail users and Mount Rogers trail users.

| Gender | Virginia Creeper Trail Use % | Mount Rogers Trail Use % | Total % |
|----------------|------------------------------|--------------------------|-----------------|
| Male % | 71.0 | 65.4 | 67.8 |
| Female % | 29.0 | 34.6 | 32.2 |
| Total N | 100 | 130 | 230 |
| Chi-Square=.36 | D.F.=2 | Sig.=.366 | Cramer's V=.060 |

Table 4. Chi-Square Analysis of differences in income levels between Virginia Creeper Trail users and Mount Rogers trail users.

| Yearly Income | Virginia Creeper Trail Use % | Mount Rogers Trail Use % | Total % |
|----------------------|------------------------------|--------------------------|-----------------|
| \$0.00 to \$19,999 | 6.5 | 8.1 | 7.4 |
| \$20,000 to \$39,999 | 26.9 | 27.4 | 27.2 |
| \$40,000 to \$59,999 | 33.3 | 33.1 | 33.2 |
| \$60,000 to \$79,999 | 17.2 | 15.3 | 16.1 |
| \$80,000 or more | 16.1 | 16.1 | 16.1 |
| Total N | 93 | 124 | 217 |
| Chi-Square=.31 | D.F.=2 | Sig.=.989 | Cramer's V=.038 |

Table 5. Differences in Socio-Demographics between Virginia Creeper Trail users and Mount Rogers trail users.

| Demographics | Virginia Creeper Trail | | | Mount Rogers trails | | | D.F. | t-value | sig. |
|-----------------|------------------------|------|-----|---------------------|------|-----|------|---------|------|
| | mean | S.D. | N | mean | S.D. | N | | | |
| Age | 41.8 | 10.6 | 100 | 40.5 | 11.3 | 130 | 227 | .88 | .38 |
| Education Level | 15.9 | 3.0 | 100 | 14.9 | 2.8 | 131 | 229 | 2.57 | .01 |
| Household Size | 2.7 | 1.2 | 99 | 2.9 | 1.3 | 131 | 228 | -1.03 | .30 |

Table 6. Chi-Square Analysis of differences in community residence between Virginia Creeper Trail users and Mount Rogers trail users.

| Community Type | Virginia Creeper Trail Use % | Mount Rogers Trail Use % | Total % |
|------------------------------------------------------------------|------------------------------|--------------------------|---------|
| Farm/Ranch | 10.1 | 21.2 | 16.4 |
| Rural/Small Town (under 1,000 pop.) | 19.2 | 19.7 | 19.5 |
| Town (1,000 to 5000 pop.) | 14.1 | 8.3 | 10.8 |
| Small City (5,000 to 50,000 pop.) | 39.4 | 22.7 | 29.9 |
| Major City (50,000 or more pop.) | 17.2 | 28.0 | 23.4 |
| Total N | 99 | 132 | 231 |
| Chi-Square=14.13 D.F.=4 Sig.=.007 Cramer's V=.247 | | | |

Table 7. Chi-Square Analysis of differences in first time/repeat use between Virginia Creeper Trail users and Mount Rogers trail users.

| Type of Visit | Virginia Creeper Trail Use % | Mount Rogers Trail Use % | Total % |
|-----------------------------------------------------------------|------------------------------|--------------------------|---------|
| First Visit | 18.8 | 24.4 | 22.0 |
| Repeat Visit | 81.2 | 75.6 | 78.0 |
| Total N | 101 | 131 | 232 |
| Chi-Square=1.05 D.F.=1 Sig.=.306 Cramer's V=.067 | | | |

Table 8. Chi-Square Analysis of differences in miles traveled between Virginia Creeper Trail users and Mount Rogers trail users.

| Distance Traveled | Virginia Creeper Trail Use % | Mount Rogers Trail Use % | Total % |
|------------------------------------------------------------------|------------------------------|--------------------------|---------|
| Less than 30 miles | 18.2 | 7.2 | 12.7 |
| 30 to 60 miles | 35.4 | 21.6 | 28.5 |
| 61 to 150 miles | 27.3 | 44.8 | 36.0 |
| Greater than 150 miles | 19.2 | 26.4 | 22.8 |
| Total N | 99 | 125 | 224 |
| Chi-Square=15.12 D.F.=3 Sig.=.002 Cramer's V=.260 | | | |

Table 9. Chi-Square Analysis of differences in total lifetime visits between Virginia Creeper Trail users and Mount Rogers trail users.

| Number of Visits | Virginia Creeper Trail Use % | Mount Rogers Trail Use % | Total % |
|----------------------------------------------------------------------------------------------------------------|------------------------------|--------------------------|---------|
| 1 to 3 | 22.1 | 25.5 | 24.0 |
| 4 to 10 | 35.1 | 30.9 | 32.7 |
| 11 to 25 | 24.7 | 25.5 | 25.1 |
| 26 or more | 18.2 | 18.2 | 18.1 |
| Total N | 77 | 94 | 171 |
| Chi-Square=.453 D.F.=3 Sig.=.93 Cramer's V=.051 | | | |

Table 10. Differences in use characteristics between Virginia Creeper Trail users and Mount trail users.

| Use Characteristics | Virginia Creeper Trail | | | Mount Rogers trails | | | D.F. | t-value | sig. |
|---------------------------------------|------------------------|-------|-----|---------------------|-------|-----|------|---------|------|
| | mean | S.D. | N | mean | S.D. | N | | | |
| Group Size | 3.5 | 3.5 | 100 | 4.8 | 3.6 | 125 | 223 | -2.66 | .01 |
| Miles Traveled | 137.7 | 317.7 | 94 | 162.7 | 176.1 | 125 | 145 | -.70 | .48 |
| Activity Hours | 8.9 | 15 | 101 | 14.6 | 16.3 | 129 | 228 | -2.74 | .01 |
| Number of Visits in the past year | 7.4 | 13.4 | 79 | 2.9 | 3.9 | 100 | 89 | 2.91 | .01 |
| Years since first visit to Mt. Rogers | 8.7 | 8.4 | 78 | 7.9 | 6.7 | 99 | 175 | .76 | .45 |
| Number of total visits to Mt. Rogers | 26.1 | 47.1 | 77 | 17.3 | 24.7 | 94 | 110 | 1.49 | .14 |

Table 11. Chi-Square Analysis of differences in overnight stay/day-use between Virginia Creeper Trail users and Mount Rogers trail users.

| Type of Stay | Virginia Creeper Trail Use % | Mount Rogers Trail Use % | Total % |
|------------------------------------------------------------------------------------------------------------------|------------------------------|--------------------------|---------|
| Overnight Stay | 27.7 | 81.3 | 54.5 |
| Day Trip | 72.3 | 18.7 | 45.5 |
| Total N | 101 | 134 | 235 |
| Chi-Square=65.92 D.F.=1 Sig.=.000 Cramer's V=.530 | | | |

Table 12. Differences in aggregate trip expenditures in dollars per individual between Virginia Creeper Trail users and Mount Rogers trail users.

| Total Trip Expenditures | Virginia Creeper Trail | | | Other Trail | | | D.F. | t-value | sig. |
|---------------------------------|------------------------|------|----|-------------|------|-----|------|---------|------|
| | mean | S.D. | N | mean | S.D. | N | | | |
| Expenses per individual per day | 49.2 | 92.7 | 86 | 31.3 | 59.3 | 112 | 117 | 1.65 | .10 |

Table 13 Differences in types of total trip expenses, within the total region between Virginia Creeper Trail users and Mount Rogers trail users.

| Type of Expenditure | Virginia Creeper Trail | | | Mount Rogers trails | | | D.F. | t-value | sig. |
|----------------------|------------------------|------|-----|---------------------|------|-----|------|---------|------|
| | mean | S.D. | N | mean | S.D. | N | | | |
| Restaurants | 9.1 | 23.3 | 101 | 2.2 | 6.7 | 134 | 113 | 2.89 | .01 |
| Food in retail store | 3.4 | 7.6 | 101 | 3.1 | 5.1 | 134 | 164 | .39 | .70 |
| Retail purchases | 3.6 | 12.0 | 101 | 1.6 | 4.5 | 134 | 121 | 1.64 | .10 |
| Hotel/Motel | 6.9 | 21.4 | 101 | .5 | 3.6 | 134 | 104 | 2.99 | .00 |
| Camping | 2.1 | 6.7 | 101 | 2.4 | 3.4 | 134 | 138 | -.37 | .71 |
| Gas and oil | 4.8 | 3.3 | 101 | 3.3 | 4.6 | 134 | 233 | 1.82 | .07 |
| Repairs/service | .46 | 3.9 | 101 | .10 | 1.2 | 134 | 113 | .89 | .37 |
| Other fees | .66 | 3.0 | 101 | .09 | .52 | 134 | 104 | 1.88 | .06 |
| All other expenses | 1.6 | 6.5 | 101 | 1.1 | 7.1 | 134 | 225 | .54 | .59 |

Table 14. Differences in expenditure types in Zone A between Virginia Creeper Trail users and Mount Rogers trail users.

| Type of Expenditure | Virginia Creeper Trail | | | Mount Rogers trails | | | D.F. | t-value | sig. |
|----------------------|------------------------|------|-----|---------------------|------|-----|------|---------|------|
| | mean | S.D. | N | mean | S.D. | N | | | |
| Restaurants | 3.8 | 12.7 | 101 | 1.0 | 2.8 | 134 | 108 | 2.31 | .02 |
| Food in retail store | 1.8 | 4.4 | 101 | 2.0 | 4.3 | 134 | 233 | -.29 | .77 |
| Retail purchases | 2.1 | 8.6 | 101 | 1.1 | 3.8 | 134 | 129 | 1.10 | .27 |
| Hotel/Motel | 3.2 | 14.7 | 101 | .23 | 2.3 | 134 | 104 | 2.07 | .04 |
| Camping | 2.0 | 6.6 | 101 | 2.3 | 3.4 | 134 | 233 | -.41 | .68 |
| Gas and oil | 2.5 | 5.4 | 101 | 1.7 | 2.8 | 134 | 233 | 1.51 | .13 |
| Repairs/service | .10 | .77 | 101 | .08 | 1.2 | 134 | 233 | -.18 | .85 |
| Parking/tolls | .16 | 1.6 | 101 | .06 | .35 | 134 | 107 | .62 | .54 |
| Other fees | .23 | 1.6 | 101 | .05 | .31 | 134 | 108 | 1.27 | .21 |
| All other expenses | 1.0 | 4.4 | 101 | 1.0 | 7.1 | 134 | 233 | -.03 | .98 |

Table 15 Differences in expenditure types in Zone B between Virginia Creeper Trail users and Mount Rogers trail users.

| Type of Expenditure | Virginia Creeper Trail | | | Mount Rogers trails | | | D.F. | t-value | sig. |
|----------------------|------------------------|------|-----|---------------------|------|-----|------|---------|------|
| | mean | S.D. | N | mean | S.D. | N | | | |
| Restaurants | 5.2 | 12.5 | 101 | 1.3 | 6.1 | 134 | 136 | 2.90 | .01 |
| Food in retail store | 1.6 | 4.6 | 101 | 1.1 | 3.0 | 134 | 161 | .97 | .33 |
| Retail purchases | 1.5 | 6.7 | 101 | .47 | 2.6 | 134 | 123 | 1.48 | .14 |
| Hotel/Motel | 3.6 | 14.4 | 101 | .27 | 2.4 | 134 | 104 | 2.33 | .02 |
| Camping | .09 | .92 | 101 | .09 | .58 | 134 | 233 | .02 | .98 |
| Gas and oil | 2.3 | 4.7 | 101 | 1.6 | 3.8 | 134 | 233 | 1.17 | .24 |
| Other fees | .43 | 2.4 | 101 | .04 | .42 | 134 | 105 | 1.63 | .11 |
| All other expenses | .60 | 3.2 | 101 | .10 | .72 | 134 | 107 | 1.53 | .13 |

Table 16. Differences in activity/place meaning between Virginia Creeper Trail users and Mount Rogers trail users.

| Meaning Variable | Virginia Creeper Trail | | | Other Trail | | | D.F. | t-value | sig. |
|--------------------------------------|------------------------|------|-----|-------------|------|-----|------|---------|------|
| | mean | S.D. | N | mean | S.D. | N | | | |
| Place Attachment | 3.39 | .73 | 97 | 3.42 | .70 | 129 | 224 | -.29 | .77 |
| Activity Involvement | 3.87 | .56 | 101 | 4.00 | .51 | 134 | 233 | -1.84 | .07 |
| Overall quality of visit | 6.0 | 1.1 | 101 | 6.1 | 1.0 | 134 | 233 | -.83 | .41 |
| Comparison of Mt. Rogers | 2.2 | 1.4 | 101 | 2.2 | 1.5 | 134 | 233 | -.03 | .98 |
| Expectations of Mt. Rogers | 3.8 | .90 | 101 | 3.8 | .80 | 134 | 231 | .29 | .77 |
| Worth the time and effort | 4.8 | .65 | 101 | 4.7 | .61 | 134 | 233 | .19 | .85 |
| Importance of Mt. Rogers to activity | 5.3 | 1.4 | 101 | 5.3 | 1.4 | 134 | 233 | .25 | .80 |
| Level of activity expertise | 4.7 | 1.2 | 101 | 5.0 | 1.3 | 134 | 233 | -1.61 | .11 |

Table 17. Chi-Square Analysis of differences in mode of experience between Virginia Creeper Trail users and Mount Rogers trail users.

| Mode of Experience | Virginia Creeper Trail Use % | Mount Rogers Trail Use % | Total % |
|--------------------|------------------------------|--------------------------|-----------------|
| Place Focus | 11.0 | 36.2 | 25.2 |
| Activity Focus | 86.0 | 56.9 | 69.6 |
| Group Focus | 3.0 | 6.9 | 5.2 |
| Total N | 100 | 130 | 230 |
| Chi-Square=22.72 | D.F.=2 | Sig.=.000 | Cramer's V=.314 |

Table 18. Chi-Square Analysis of differences in Activity Types between Virginia Creeper Trail users and Mount Rogers trail users.

| Type of Activity | Virginia Creeper Trail Use % | Mount Rogers Trail Use % | Total % |
|-------------------------|------------------------------|--------------------------|----------------|
| Hiking (N=85) | 10.4 | 60.4 | 39.6 |
| Bicycling (N=90) | 80.2 | 10.4 | 39.6 |
| Horseback Riding (N=48) | 9.4 | 29.1 | 20.9 |
| | N=96 | N=134 | N=230 |
| Chi-Square=114.00 | D.F.=2 | Sig.=.00 | Cramer's V=.71 |

Table 19. An Examination of the Effects of Activity Type on Select Study Variables

| Variable | Hiking | Horseback Riding | Bicycling |
|---------------------------------|------------|------------------|------------|
| Total Sample Size | N=85 | N=48 | N=90 |
| Ave. Group Size | 4.5 people | 4.6 people | 3.8 people |
| Ave. Frequency of Use per Annum | 2.4 visits | 3.8 visits | 7.9 visits |
| Ave. Education Level | 15.9 years | 13.0 years | 16.0 years |
| Ave. Total Expenses | \$39.24 | \$23.44 | \$50.37 |
| Ave. Activity Involvement (1-5) | 3.8 | 4.4 | 3.8 |
| Ave. Place Attachment (1-5) | 3.2 | 3.8 | 3.4 |
| Length of Stay | % | % | % |
| Day Use | 21.1 | 2.2 | 85.0 |
| One Night | 14.4 | 22.2 | 6.0 |
| Two Nights | 32.9 | 48.9 | 4.5 |
| Three Nights | 17.1 | 17.8 | 3.0 |
| Four + Nights | 14.5 | 8.9 | 1.5 |
| Hours in Activity | | | |
| 0 to 5 Hours | 25.0 | 8.3 | 55.6 |
| 6 to 8 Hours | 32.5 | 16.7 | 37.8 |
| 9 to 23 Hours | 26.3 | 52.1 | 5.6 |
| 24 + Hours | 16.3 | 22.9 | 1.1 |
| Type of Community | | | |
| Farm/Ranch | 8.2 | 51.1 | 6.9 |
| Rural Town | 18.8 | 23.4 | 19.5 |
| Town | 5.9 | 14.9 | 13.8 |
| Small City | 24.7 | 8.5 | 44.8 |
| Large City | 42.4 | 2.1 | 14.9 |

Table 20. Summary Results of the Hypotheses Tests

| Variable Type | Significant Differences Found | Non-Significant Differences |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Socio-Demographic Characteristics | VCT more highly educated MTR tended to have higher percentage coming from farms and large cities. | Gender Age Income Household Size |
| Use Characteristics | VCT tended to have higher percentage traveling shortest distances VCT had smallest group size VCT spent less time in activity during visit VCT visited area more frequently in last 12 months VCT tended to be day users while MTR tended to be overnight users | First time/Repeat use Total visits to area Years since first visit to area |
| Trip Expenditures | VCT spent more on specific types of expenses such as... Restaurants Hotel/Motel | No differences in total trip expenses No differences in specific types of expenses such as... Food/Beverage in Retail Other Retail Purchases Camping Fees Gas/Oil Repairs/Service Parking/Tolls Other Fees All Other Expenses |
| Meanings Associated with Trail Use | VCT were more activity focused and MTR were more place focused according to Mode of Experience item. | Place Attachment Activity Involvement Overall Quality of Visit Comparison of the Area Expectations for the Area Worthwhile-ness of the Visit Importance of Area to activities Level of Activity Expertise |

VCT= Virginia Creeper Trail users MTR= Mount Rogers trail users

Chapter V

DISCUSSION AND CONCLUSIONS

This chapter discusses and interprets the results of study hypotheses. It is divided into four sections. The first section discusses differences found relevant to socio-demographics, use characteristics, expenditures, and meanings associated with settings and activities. The second section draws overall conclusions based on statistical differences and other interpretations. Cautions for interpretation and study limitations are presented in the this section. The third section discusses the results as they relate to management implications. The final section presents recommendations for further research and study.

User Characteristics

Of the six user characteristics variables analyzed, only two showed significant statistical differences. Educational levels were higher for Virginia Creeper Trail users in comparison to Mount Rogers trail users. However, both groups exhibited high levels of education, as demonstrated by means of 15.9 years and 14.9 years respectively. Community type also varied with respect to the two user groups. Mount Rogers trail users tended to have higher proportions residing on a farm/ranch and in major cities (50,000 or more pop.), while Virginia Creeper Trail users tended to contain a larger amount of use coming from small cities (5,000 to 50,000 pop.). These results are influenced by the type of activity (See Table 19) in that they suggest Mount Rogers trail use is attracting more trail use from major cities and horse use from local or regional users residing on farms/ranches. The Virginia Creeper Trail, however, may be attracting more

regional users from nearby small cities such as Abingdon, Bristol, Johnson City, and Kingsport.

Other user characteristic variables demonstrated no statistically significant differences between the groups. These variables included gender, age, income, and household size. Since the two groups revealed few demographic differences, one could draw the conclusion that the two groups are essentially similar. Demographic indicators do not suggest similar management preferences regarding such issues as trail development and maintenance. They do, however, provide a solid starting point in which to demonstrate who is receiving the benefits of public expenditures on travel resources. Demographics are also useful in that they can be examined against past research linking demographics to use patterns such as activity behavior and buying behavior. For example, previous knowledge that well educated users with higher levels of income tend to participate in bicycling rather than hiking and horseback riding might indicate that well educated people with high levels of income at other rails trails would also tend to participate in bicycling.

Study findings correspond well with past rail-trail findings on variables that have been consistent across a variety of rail-trails. Moreover, groups size, proximity to trail, frequent use, repeat use, and trail meanings were fairly similar. Roggenbuck and Stubbs (1990) study of the Greenbrier River Trail, a rail-trail, noted that group size was small (2.9 people per group) and that repeat use was high at 70%. This study found that rail-trail group size was also small (3.5 people) and that repeat usage was 81.2 %. Moore et al. (1992) found that the average age of rail-trail users ranged between 38 to 50 years depending on the trail studied, frequency of use per annum was high at 81 visits, and half the use was represented by users living close to the trail (under 10 miles). The present study found that the average age of Virginia Creeper Trail users was 41.8 years, frequency

of use was higher than other Mount Rogers visitors at 7.4 visits per annum and that half the usage traveled local distances, 60 miles or less, to reach the trail. Because of the rural nature of the area and because of the limited accessibility of the Virginia Creeper Trail within National Recreation Area boundaries, distances traveled up to 60 miles were considered local use.

Satisfaction with and attachment to rail-trail settings were high for this study and previous studies. Moore, et al. (1992) found that the average overall satisfaction level was 5.7 on a 7 point scale while this study found that the quality of their visit, a surrogate satisfaction measure, was 6.0 on a 7 point scale. Place attachment was another measure of meaning assessed with these both these rail-trail studies. Results seemed to confirm that user groups in both studies exhibited high levels of place attachment. Findings of this thesis are encouraging in that they compare well against past rail-trail studies. However, as the main purpose of this study is to compare rail-trails with other trail opportunities, further elucidation of these similarities is beyond the scope of this thesis.

Use Characteristics

This study examined differences in use characteristics ranging from variables focusing on the group (group size), the setting (length of association, frequency of visits), the activity (hours in activity, type of activity), and travel patterns (miles traveled, overnight/day-use stay). Of the nine use characteristics examined, six revealed significant differences.

Group size varied such that Virginia Creeper Trail users seemed to travel in smaller groups than Mount Rogers trail users. Virginia Creeper Trail group size was an average of 3.5 people per party compared Mount Rogers trail users' average party size of

4.8. Hours spent in trail activity varied between the two groups. Virginia Creeper Trail users spent less time in their most important activity than did Mount Rogers trail users with means of 8.9 hours and 14.6 hours respectively. Time spent in trail activity was measured on a "per trip" basis, therefore, it is reasonable to assume that a higher proportion of overnight stay accounted for this difference. In order to verify this conjecture, differences in overnight stay between the two groups were examined. Results confirmed suppositions since 81.3% of Mount Rogers trail use stayed overnight while only 27.7% of Virginia Creeper Trail use stayed overnight.

Another use variable of interest to managers is the number of visits. This variable was measured through two items in this study: number of visits in the past 12 months and number of total visits over the course of a lifetime. Lifetime visits did not differ significantly between the two groups, however, visits in the past 12 months did reveal statistical differences. Virginia Creeper Trail users averaged a higher amount of annual visits (7.4) when compared to Mount Rogers trail user yearly visits (2.9). This finding suggests that, currently, Virginia Creeper Trail users consist of frequent or regular users of the Mount Rogers National Recreation Area.

One would also assume that regular visits suggest a close proximity with respect to the trail (i.e. how far users have to travel to get to the trail). Understanding distance traveled is important to marketing in that it may provide insights into the "who" and "where" of a thorough visitor analysis. This variable is also important because it may also relate to trip expenditures. To examine whether the two groups were traveling different distances, an analysis of miles traveled and regional origins was utilized which asked respondents to estimate their total mileage of their trip from home to the Mount Rogers National Recreation Area.

Initial findings based on a t-test analysis revealed no significant differences yet standard deviations varied considerably suggesting that while means did not differ, percentage differences with respect to ranges of travel distances may. Chi-square analysis of travel distances did indeed reveal differences in mileage between the two trail usage groups. Moreover, Virginia Creeper Trail users seemed to contain a higher proportion of those traveling under 30 miles to reach the trail site than Mount Rogers trail use (18.2% vs. 7.2% respectively). The highest proportion of Mount Rogers trail users traveled regional distances (61 to 150 miles) in order to reach the site while the highest proportion of Virginia Creeper Trail use traveled local distances (30 to 60 miles) in order to reach the trail. The most similar proportions between both trail groups traveled extended distances (greater than 150 miles) suggesting that each type of trail opportunity seems to attract an equal amount of non-regional usage.

A final and critical, use characteristic difference involved comparing activity types. Virginia Creeper Trail users seemed to consist almost entirely of bicyclists (80.2%) and Mount Rogers trail users contained a very high proportion of hikers (60.4%) and horseback riders (29.1%). Due to this disparity in activity type, managers should consider that study results may be influenced by the interaction of activity type and trail setting. Management implications of this finding will then be discussed in the appropriate section of this chapter.

Up to now, use variables that exhibit group differences have been discussed. Some use variables examined, however, failed to show statistically significant differences between groups. These variables included first time/repeat use and years since first visit. These findings are surprising when one considers the fact that the Mount Rogers National Recreation Area was established in the mid 1960's and the Virginia Creeper Trail was open for trail use in the mid 1980's. Since Mount Rogers as a National Recreation Area

was established first, one may expect users of the area, including general trail users, to have a longer length of association with Mount Rogers. One possible explanation could be that trail use of the Mount Rogers National Recreation Area did not increase or become established until this area's reputation and opportunities were well known, thus both types of trail user groups began using the area at the same time.

In addition to understanding use and user characteristics, site managers are also concerned with the extent that recreation opportunities provide a community economic base. It is often useful to know which opportunities are the "cash cow" (those opportunities providing the community with the largest economic benefits). Rail-trails have recently been touted as wise recreation investments since they cost less than other trail opportunities to develop and they seem to attract frequent users and users who spend considerable money in the trail's host community. This thesis examined the economic impact of the Virginia Creeper Trail and compared it against the economic impact of other non-rail trail opportunities. A discussion of these differences is therefore appropriate.

Expenditures

Trip expenditures were assessed by asking respondents to indicate both the total amount that they spent on the trip and the amount that they spent on specific classes of items in the Mount Rogers National Recreation Area and inside an interstate highway corridor (Interstates 77 and Interstates 81). Respondents were first asked if they provided for their own expenses, paid for the expenses of others, or shared expenses. This question was intended to control for group size with respect to those respondents paying for the expenses of others. Expenditures were initially assessed on a per trip basis, but in order to

control for the differences in lengths of stay, expenditures were re-analyzed on a per visit day basis.

Analysis of trip expenditures showed no significant differences when group size and length of stay were not controlled. When they were controlled, differences in specific types of expenditures existed between Virginia Creeper Trail users and Mount Rogers trail users. It appears that, when the larger group size and the longer length of stay of Mount Rogers trail users was accounted for, this group spent less on hotel accommodations and restaurants than Virginia Creeper Trail users. Such a finding may be a function of where the groups tended to stay the longest. For example, Virginia Creeper Trail users could have utilized areas outside the Mount Rogers National Recreation Area where there were more opportunities for trip expenditures (i.e. hotels and restaurants). An investigation of these specific expenditures within two regions, the National Recreation Area corridor and the outside area within the I-81/I-77 corridor, then provided a means to assess if expenditure differences resulted from the availability of spending opportunities.

The analysis focused on specific trip expenditures for the entire region and it also split specific trip expenditures according to the Mount Rogers National Recreation Area corridor and the I-77/I-81 corridor surrounding that area. Results with respect to specific expenditures for the combination of corridor zones suggested that Virginia Creeper Trail users spent more on restaurants and hotel accommodations than Mount Rogers trail users. This observation is not surprising when one considers the possibility that the latter group may have tended to stay in areas outside National Recreation Area boundaries.

This thesis also analyzed specific trip expenditures by separating the entire Mount Rogers region into the immediate National Recreation Area and the outside, surrounding area within the I-77 and I-81 corridor. The examination of various "zones" was incorporated into the analysis in order to give managers a better understanding of how the

different areas fulfilled various service/product needs. It also served to confirm whether the increased expenditures of Virginia Creeper Trail users were consistent with respect to both zones. Analysis revealed that there were stronger group differences in the outlying interstate corridor zone than in the National Recreation Area zone on restaurants and hotel accommodations. Each expenditure type was significantly higher for Virginia Creeper Trail users in both zones.

Expenditure findings, both aggregate and specific, seem to confirm the notion that, when controlling for group size and length of stay, Virginia Creeper Trail users provide more economic benefits or inputs to the local hotels and restaurants. This conclusion should, however, be handled with caution because while hotel and restaurants expenditures may be high, they may also come from a small minority of Virginia Creeper Trail users. Since expenditures were measured through average expenses of all trail users, it is reasonable to assume that many Virginia Creeper Trail users spend no money during their visit. One should also consider that Virginia Creeper Trail users visit more frequently and stay for shorter lengths of time. In order to increase expenditures from the Virginia Creeper Trail, managers may consider efforts to increase trail users' length of stay and to promote the Virginia Creeper Trail to more distant markets.

So far, this thesis has discussed a variety of differences in use characteristics, user characteristics, and trip expenditures between two types of trail users. These are useful variables for managers because they give a clearer picture of who trail users are and how they differ behaviorally. These variables, however, do not address the "whys" of the recreation experience which may arguably precede and predict use characteristics. In addition, variables that measure motivations, preferences for management, and meanings associated with settings and setting activities may be more useful for marketing practices such as recreation site development, advertising, and support services development. Such

variables address the specific rationale of why a site or activity is chosen over other competing destinations or activities of interest. This thesis then explored and analyzed level of meanings associated with the recreation setting and trail activities in order to gain a better understanding of how the two trail groups differed in their attitudes toward activity experiences and recreation settings.

Setting and Activity Meanings

One way to assess meanings was to look at satisfaction. A number of questions addressed satisfaction related attitudes such as a comparison of Mount Rogers to other sites, met expectations, and the worthwhile-ness of the visit. There were no differences in any of these satisfaction variables with respect to Mount Rogers trail use and Virginia Creeper Trail use. As expected, both users seemed to exhibit high levels on these satisfaction measures.

Other measures dealt with attachment or involvement with the setting and associated trail activities. Such measures included level of activity expertise, activity involvement, importance of the Mount Rogers area to activities, and place attachment to the National Recreation Area. Again, no significant group differences were found. Such results may imply that trail meanings, as measured by this study, are not different between the two trail groups. This conclusion, however, may be inaccurate because while the two groups exhibit similar levels of satisfaction, they may also be gaining different benefits from the experience based on varying motives. Because of the parent project's scope and focus, however, a detailed analysis of trail and activity motivations was not possible. Even if these motives were assessed in this study, they would still be subject to and affected by the differences in activity type.

This thesis was able to assess one general measure of motivation which assessed the most important reason for visiting the Mount Rogers National Recreation Area. This variable, mode of experience, assessed whether respondents went to the site because they enjoyed the place itself, because it was a good place for their outdoor activities, or because they wanted to spend more time with their companions. Results indicated that Virginia Creeper Trail users tended to visit because the site was a good place for their outdoor activities (bicycling) while Mount Rogers trail users (hikers and horseback riders) visited because they enjoyed the place itself. A small and equal percentage of both user groups stated that they visited in order to spend time with companions. Group differences with respect to this mode of experience may provide managers with insights into where to focus management efforts. Results from this thesis would seem to indicate that managers should provide Mount Rogers trail users who are loyalists tied to the place with setting attributes that facilitate their enjoyment of the place itself. Virginia Creeper Trail users may wish for facilities and services that promote their enjoyment of activities without detracting from the physical attributes of this setting.

Overall Conclusions

The results of this study provide tentative evidence that rail-trail users are significantly different than other general trail users in a comparable environment with respect to use characteristics, hotel and restaurant expenditures, and mode of experience. Differences in demographic characteristics and other trail meanings such as level of satisfaction, attachment, and involvement were, however, almost non-existent. In order to provide a summary comparison of the two groups, a profile table based on user characteristics, use characteristics, expenditures, and meanings is presented in Table 21.

Based on the differences in their profiles, Virginia Creeper Trail users may be viewed as short range travelers who were day-users that spent more money per person per day on restaurants and hotels and stayed for shorter time periods than other Mount Rogers trail users. Frequency of visitation was higher for this trail use group. They participated in their activity in small groups or alone and they focused primarily of the activity. Mount Rogers trail users, alternatively, traveled mid-range distances and tended to stay overnight, thus they spent more time in their trail activity. They spent less money per person per day on restaurants and hotels and they stayed longer in the Mount Rogers vicinity. They tended to travel in larger groups and they viewed the site itself as the most important reason for their visit. These conclusions while easily depicted, are influenced by a few confounding variables. These confounding variables and other study limitations are discussed in the following section followed by management implications and recommendations for further study.

Table 21. Profile of Mount Rogers trail and Virginia Creeper Trail users

| Variable Type | Virginia Creeper Trail users | Mount Rogers trail users |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| User Characteristics | <p>Generally male with household incomes between \$20,000 and \$59,999</p> <p>Average age of 41.8 years with an average education level of 15.9 years living in households of 2.7 people residing in towns and small cities.</p> | <p>Generally male with household incomes between \$20,000 and \$59,999</p> <p>Average age of 40.5 years with an average education level of 14.9 years living in households of 2.9 people residing in both farms, small towns and large cities.</p> |
| Use Characteristics | <p>Generally repeat users traveling in groups of 3.5 people spending an average of 8.9 hours in trail activity per visit.</p> <p>Visited Mount Rogers 7.4 times in the past year and 26.1 times in a lifetime. First site visit was an average 8.7 years ago. Tended to be more local travelers who were day users and bicyclists.</p> | <p>Generally repeat users traveling in groups of 4.8 people spending an average of 14.6 hours in trail activity per visit.</p> <p>Visited Mount Rogers 2.9 times in the past year and 17.3 times in a lifetime. First site visit was an average 7.9 years ago. Tended to be more regional travelers who were overnight users and hikers.</p> |
| Expenditures | <p>Spent an average of \$49.20 on total trip expenditures. Spent an average of \$9.10 per day on restaurants, \$6.90 on hotel accommodations, \$2.10 on camping fees, and \$4.80 on gas and oil expenses.</p> | <p>Spent an average of \$31.30 on total trip expenditures. Spent an average of \$2.20 per day on restaurants, \$0.50 on hotel accommodations, \$2.40 on camping fees, and \$3.30 on gas and oil expenses.</p> |
| Trail/Activity Meanings | <p>Appraised Mount Rogers as a high quality site exceeding expectations, important to activities, and well worth time and effort. Exhibited high levels of place attachment, activity involvement, and activity expertise. Visited the site for the outdoor activities they enjoy.</p> | <p>Appraised Mount Rogers as a high quality site exceeding expectations, important to activities, and well worth time and effort. Exhibited high levels of place attachment, activity involvement, and activity expertise. Visited the site because they enjoy the place itself.</p> |

Study Limitations

The finding that Virginia Creeper Trail users consisted of fewer overnight users may have more to do with initial sampling procedures. During the first few months of sampling, campers in the Mount Rogers National Recreation Area who were contacted on the Virginia Creeper Trail were not included in the sample in order to decrease the possibility of double-sampling. Such a sampling procedure may increase the likelihood of larger proportions of day use for the Virginia Creeper Trail. Variables such as time engaged in activity, and miles traveled could be less for Virginia Creeper Trail users as a result. The likelihood of this effect on findings, however, is minimal because omitting Mount Rogers camping use from the Virginia Creeper Trail sample was only performed for approximately one month and only five to eight on-site interviews were lost as a result. Later sampling included 10 to 15 respondents who were staying at a campground in the Mount Rogers National Recreation Area and were interviewed on the Virginia Creeper Trail. This inclusion of Mount Rogers overnight campers was enacted in order to increase the sample size of Virginia Creeper Trail use in spite of the possibility of double sampling.

Proportion of activity types between the two trail groups may be subject to sampling biases as it was easier to stop and contact bicyclists compared to horse riders at the Virginia Creeper Trail and it was easier to access larger amounts of horse users and hikers in the campground areas. This study indicated that a surprising proportion of Virginia Creeper Trail users were bicyclists (80.2%) and a high proportion of Mount Rogers trail users were hikers (60.4%) and horseback riders (29.1%). These figures, however, may not be as astounding when one considers that studies of other rail-trail settings have demonstrated similar results. For example, the St. Marks Trail obtained 81% of its use from bicyclists, 13% of its use from walkers or joggers, and 4% of its use

from horseback riders (Moore, et al., 1992). In summary, differences in activity types between the two trail use groups of this study are fairly accurate yet horse use may be slightly under-represented in the rail-trail use group.

Another study limitation involved classifying who Virginia Creeper Trail users were and who users of other Mount Rogers trails were. More specifically, this study was unable to identify if respondents contacted at overnight camping sites and other day-use sites spent any time on the Virginia Creeper Trail. Only one survey question assessed time spent at a particular site. In this question, respondents were asked to indicate the site where they spent the most time. Not surprisingly only six campground users stated that they spent the most time on the Virginia Creeper Trail. As a result, some Mount Rogers trail users could, in actuality, be Virginia Creeper Trail users by spending less time on this trail than in the campgrounds and other day-use areas. The Mount Rogers trail sample may have more campground users compared to the Virginia Creeper Trail sample.

Another limitation involves the extent to which findings are representative of total Virginia Creeper Trail use. Since this study only sampled users on the National Recreation Area's portion of this rail-trail, many of the various users in the western portion were left out of the analysis. Omitting this section in sampling may affect expenditures and activity types since one town along its length, Abingdon, attracts a variety of tourists and contains a variety of regular walkers and joggers.

Finally, while rail-trail results regarding use, user characteristics, expenditures, and meanings were similar to past rail-trail findings, concepts of motivations were not assessed. Therefore perhaps an additional differentiation between rail-trails and other trail opportunities based on varying motives/benefits was not accomplished. Findings with respect to motivations may have confirmed past rail-trail studies that have demonstrated

safety/security and health/fitness benefits. Further assessment of these motives and benefits should, therefore, be addressed in future studies.

Management Implications

The results of this reset offer some useful insights for managers of the Mount Rogers National Recreation Area. It suggests that while rail-trail users and general trail users do not differ demographically, they do follow different use characteristics and expenditure patterns. Within the context of legislation and policy, managers of the Mount Rogers National Recreation Area should work in cooperation with community businesses and services in order to provide the correct mix for both types of trail users.

If enhancing the communities' economic base through recreation and tourism development is a mutually supported goal, managers may want to consider attempting to increase Mount Rogers trail users' frequency of visitation through a variety of incentives such as providing frequent user discounts and services. Economic impacts from Virginia Creeper Trail users may also be further increased by convincing this group to stay longer on trip visits especially for those long distance travelers. To this end, the local community should consider offering and/or promoting additional attractions and services consistent with the nature of the Mount Rogers National Recreation Area. One such service that is already provided, bike shuttle service, may be further developed and expanded so that additional users may have an opportunity to use the National Recreation Area of the trail while being able to get back to town conveniently. Since Virginia Creeper Trail users already tend to spend more at hotels and restaurants, managers should encourage these establishments to use the Virginia Creeper Trail as a reason to visit the area and explore other community attractions.

The observation that Virginia Creeper Trail use attracts the highest proportion from nearby areas and an equal proportion of long range destination travelers may suggest two important types of Virginia Creeper Trail users make up the user population: frequent/local users and high expenditure/long distance travelers. Segmenting according to the different benefits of these two use types may then be appropriate in order to better meet the needs of most users and to lessen the effects of any conflict between these types of rail-trail users.

Differences in activities between the two trails may suggest that the Virginia Creeper Trail be marketed to bicyclists as an alternative to Mount Rogers trails in order to decrease the conflict between horseback riding and bicycling at Mount Rogers trails. Perhaps promotional literature and zoning regulations could position Mount Rogers trails as hiking and horseback riding trails and the Virginia Creeper Trail and other regional rail-trails (i.e. New River Trail) as bicycling trails.

The finding that Virginia Creeper Trail users view the activity as the most important reason for their visit suggests to management that resource facilities and services focusing on particular activities should be emphasized and positioned according to the desires of the current use group. For example, a small museum/bike rental building is already located at the rail-trail's beginning in Abingdon. Perhaps a similar set-up could be placed at the trail's beginning in Whitetop. Mount Rogers trail users, alternatively, view the place itself as the most important reason for their visit. As a result, management should consider assessing current place attributes and maintaining the place as it is for the areas that this group frequents or favors.

In summary, recreation managers need to consider the full range of different uses that occur in their area. They should be cautious about managing differently for those uses which seem different but for all practical purposes are similar. This study

demonstrated that while two types of trail users were similar demographically, they exhibited different types of use patterns, characteristics, specific expenditures, and (in a tentative sense) reasons for visiting.

Suggestions for Further Research

Foremost among the needs for further rail-trail study as it relates to comparisons with other trail opportunities is the need to assess the different motivations and benefits that each trail user gains from the experience. These motivations relate to the underlying reasons why people use certain facilities through certain activities. Differences found with respect to these motivations may give managers a better idea of how to position promotion efforts and facility/service development. While this thesis examined the most important reason for visiting Mount Rogers (activity, place, or group reasons), it did not assess the importance of benefits such as preservation, health/fitness, challenge, and contemplation. Such detailed benefits could help managers provide more specific activity and site opportunities. To this end, additional research should assess benefits and management preferences in further detail and specific to the unique trail setting of interest.

Future research should also examine seasonal differences in use between rail-trail and other trail settings. For example groups may vary with respect to variables such as activity type in the winter months as opposed to the summer months. Rail-trail and general trail comparisons should also be incorporated through a variety of different settings locations since this study focused on only one area containing both types of trails. This recommendation also holds relevance for comparing differences in place attachment and activity involvement. Since this study assessed attachment to the general Mount Rogers area, differences could not be directly linked to trail attachment. Both trail groups

were using the Mount Rogers National Recreation Area, thus differences in measures of affect were not substantial. Perhaps a study regarding different rail-trail attachments and general trail attachments would demonstrate differences in place attachment and activity involvement across settings. If such differences are demonstrated, segmenting by place attachment and activity involvement may then provide a useful measure toward an understanding of how the groups with varying levels of attachment and involvement exhibit different preferences for management.

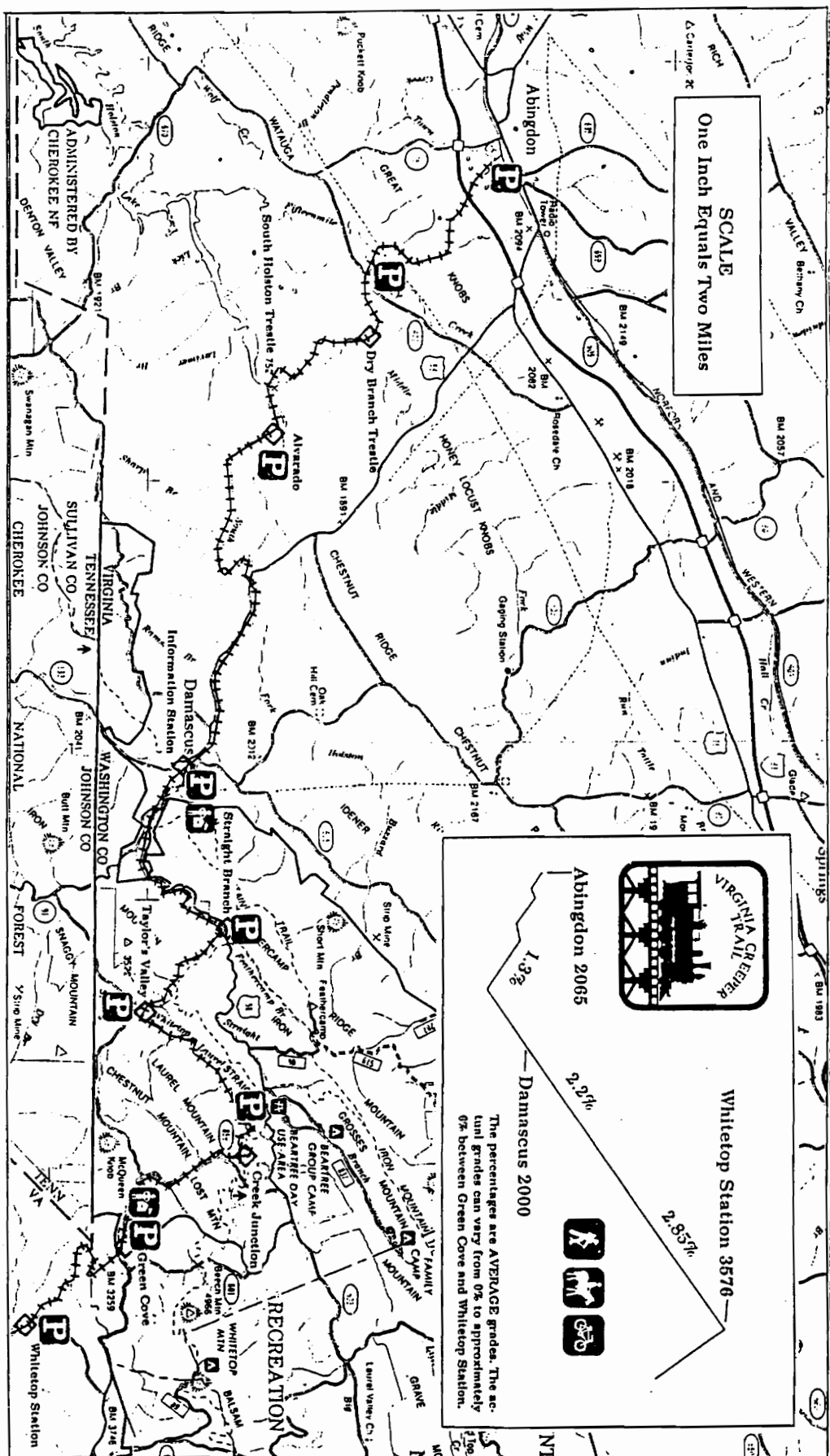
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Appendix A
MAP OF VIRGINIA CREEPER TRAIL



SCALE
One Inch Equals Two Miles

Abingdon 2065

Damascus 2000

White Top Station 3576

2.95%

2.95%

1.32%

2.95%

The percentages are AVERAGE grades. The actual grades can vary from 0% to approximately 0% between Green Cove and White Top Station.

Icons: Hiker, Horse, Mountain Biker

Logo: VIRGINIA CREEPER TRAIL

Appendix B

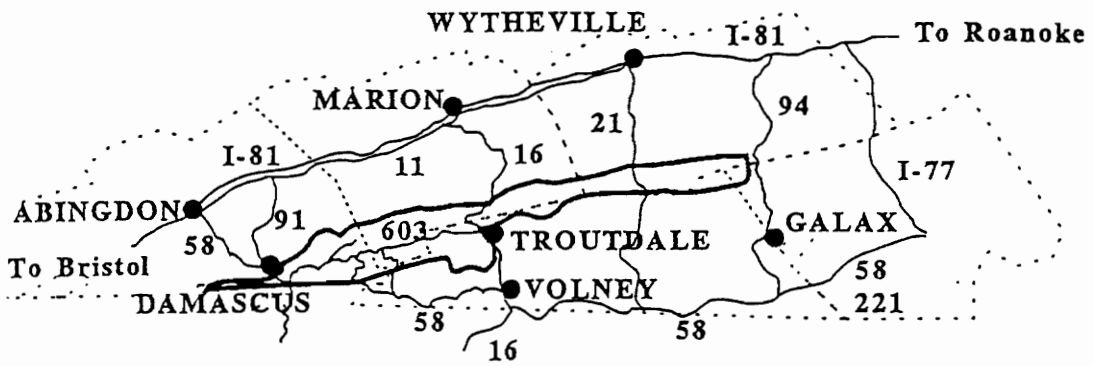
ON-SITE INTERVIEW FORM: DAY-USE

Mount Rogers On-Site Contact Sheet
Day-Use Sampling

1. Have you or will you be staying overnight in the Mt. Rogers area on this trip?
 _____ No
 _____ Yes. If yes, what type of accommodations will you be using and how many nights will you be staying at each?
 _____ Friends/relatives _____ Hotel/motel
 _____ Bed & breakfast _____ Campground
 _____ Nights If campground, which? _____

(If a Mt. Rogers campground is being used on this trip, terminate the interview.)

2. How many people are in your group, including yourself?
 _____ People
3. How would you describe your relation to other members of your groups? (Check all that apply)
- | | |
|---------------------------|-----------------------------|
| _____ Intimate friend | _____ Spouse (wife/husband) |
| _____ Own parents | _____ Own children |
| _____ In-Laws | _____ Grandparents |
| _____ Close friends | _____ Other family members |
| _____ Business Associates | _____ Other |
4. Have you (or any member of your group) been to Mt. Rogers before?
 _____ Yes, the respondent has been to Mt. Rogers
 _____ No, the respondent has not been, but at least one group member has been
 _____ No, no one in the group has been to Mt. Rogers before
5. What are the main purposes of your trip? (Check only one.)
 _____ Recreation or vacation
 _____ Visiting family or friends
 _____ Business purposes
 _____ Passing through to another destination
 _____ Other _____
6. Which one of the following statements best describes this site in relation to other recreation destinations on this trip?
 _____ This is the only site that I planned to visit
 _____ I planned to visit several recreation areas on this trip, but this is the main one
 _____ I planned to visit several recreation areas on this trip, but this is NOT the main one
 _____ This site is one of several recreation areas that I wanted to visit equally on this trip
7. When did you first arrive at Mt. Rogers on this trip?
 _____ Date _____ Time (AM/PM)
8. When did you plan on leaving Mt. Rogers?
 _____ Date _____ Time (AM/PM)
9. How many miles did you travel from home to come to Mt. Rogers NRA?
 _____ Miles



10. Please outline your travel route on the map.

We would like to give you a questionnaire in order to get information on your enjoyment, use, and management preferences for Mt. Rogers. The U.S. Forest Service is trying to maintain the beauty of this area while still providing the best possible recreation experiences. To do this they need your input from this questionnaire.

Name

Address

City State Zip

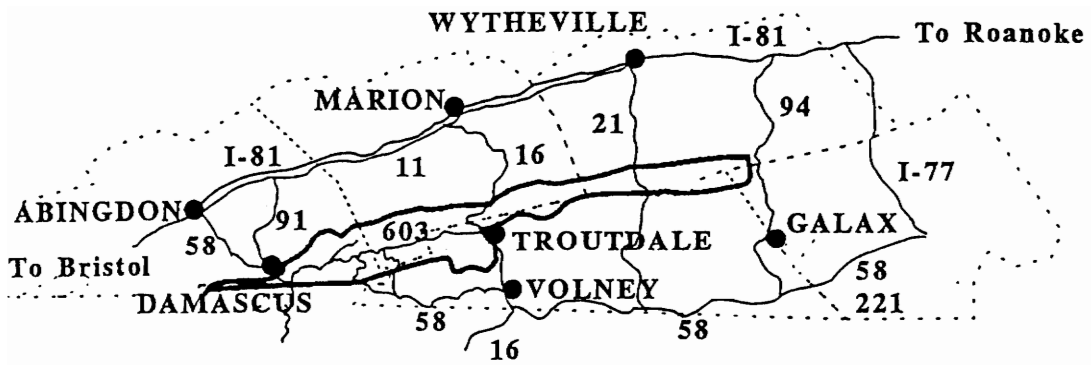
Appendix C

ON-SITE INTERVIEW FORM: OVERNIGHT CAMPING

Mount Rogers On-Site Contact Sheet
Overnight Campground Sampling

1. How many nights do you plan to stay in this camping area?
_____ nights
- 1a. On this trip, do you plan to camp or stay overnight at any other location?
_____ No
_____ Yes. If yes, what location and how many nights?
_____ Location
_____ Number of nights
2. How many people are in your group, including yourself?
_____ People
3. How would you describe your relation to other members of your groups? (Check all that apply)

| | |
|---------------------------|-----------------------------|
| _____ Intimate friend | _____ Spouse (wife/husband) |
| _____ Own parents | _____ Own children |
| _____ In-Laws | _____ Grandparents |
| _____ Close friends | _____ Other family members |
| _____ Business Associates | _____ Other |
4. Have you (or any member of your group) been to Mt. Rogers before?
_____ Yes, the respondent has been to Mt. Rogers
_____ No, the respondent has not been, but at least one group member has been
_____ No, no one in the group has been to Mt. Rogers before
5. What are the main purposes of your trip? (Check only one.)
_____ Recreation or vacation
_____ Visiting family or friends
_____ Business purposes
_____ Passing through to another destination
_____ Other _____
6. Which one of the following statements best describes this site in relation to other recreation destinations on this trip?
_____ This is the only site that I planned to visit
_____ I planned to visit several recreation areas on this trip, but this is the main one
_____ I planned to visit several recreation areas on this trip, but this is NOT the main one
_____ This site is one of several recreation areas that I wanted to visit equally on this trip
7. When did you first arrive at Mt. Rogers on this trip?
_____ Date _____ Time (AM/PM)
8. When did you plan on leaving Mt. Rogers?
_____ Date _____ Time (AM/PM)
9. How many miles did you travel from home to come to Mt. Rogers NRA?
_____ Miles



10. Please outline your travel route on the map.

We would like to give you a questionnaire in order to get information on your enjoyment, use, and management preferences for Mt. Rogers. The U.S. Forest Service is trying to maintain the beauty of this area while still providing the best possible recreation experiences. To do this they need your input from this questionnaire.

Name

Address

City State Zip

Appendix D
MAIL SURVEY INSTRUMENT

**1993 MOUNT ROGERS
NATIONAL RECREATION AREA
VISITOR SURVEY**



**Department of Forestry
Blacksburg, VA**

**Jefferson National Forest
USDA Forest Service
Roanoke, VA**

Dear Mt. Rogers National Recreation Area Visitor:

Thank you for agreeing to participate in this study. As you know, Mt. Rogers National Recreation Area is a precious resource. It protects a natural landscape and is the home of deer, bear, bobcat, turkey and other wild animals. It also preserves remnants of our pioneer heritage and provides visitors with a wide variety of recreational experiences. Management of Mt. Rogers is a complex task. To assist managers in this process, more information is needed about you, the visitor to the area.

Enclosed is a questionnaire that deals with your use of Mt. Rogers National Recreation Area and the surrounding area, your trip expenses, and the features of the area that are important to you. Because some of the questions explore what you did and saw at Mt. Rogers, please wait until after your visit to complete the survey. However, we request that you respond to the survey as soon after the visit as possible, while the experience is still fresh in your mind.

Because only a sample of Mt. Rogers visitors has been selected to participate in the survey, it is important that you take the time to complete the questionnaire if the results are to be representative of all visitors. When you have finished, please place the questionnaire in the self-addressed, stamped envelope and drop it in the mail. Individuals who complete and return the questionnaire will be entered in a random lottery drawing for a \$50.00 US savings bond. The winner will be notified by mail in November, 1993.

The questionnaire has an identification number for lottery and mailing purposes only. Your response will be held in the strictest confidence. All results will be analyzed in such a way that your answers on any single question cannot be identified with you.

We greatly appreciate your help with this study.

Sincerely,

Daniel R. Williams
Assistant Professor of Forest Recreation

Your Use of the Mount Rogers National Recreation Area (NRA)

Please answer all questions based on your group's visit to Mt. Rogers NRA on _____, 1993.

1. Was this your first trip into the Mount Rogers NRA?

- _____ Yes. If Yes, go to Question 2
_____ No. If No, please answer a, b, c below

a. How many times have you visited Mt. Rogers NRA?

_____ Number of visits

b. How many years ago did you first visit Mt. Rogers NRA?

_____ Years ago

c. How many times have you visited Mt. Rogers within the past year?

(Do not count this trip.)

_____ Times

2. In what area did you spend the most time while visiting Mt. Rogers?

(Circle only one.)

- | | |
|---------------------------------|----------------------------|
| 1. Beartree | 11. Shepherds Corner |
| 2. Grindstone | 12. Hussy Mountain |
| 3. Raven's Cliff | 13. Raccoon Branch |
| 4. Hurricane | 14. Comers Rock |
| 5. Skulls Gap | 15. Scenic Byway |
| 6. Whitetop | 16. Fox Creek |
| 7. Hale Lake | 17. Elk Garden |
| 8. Mt. Rogers Visitors Center | 18. Appalachian Trail |
| 9. Virginia Creeper Trail | 19. Grayson Highlands S.P. |
| 10. Other; please specify _____ | |

3. What were the date and approximate time that you left the Mt. Rogers area to return home or to continue on to your next destination?

_____ Date _____ Time (am/pm)

4. Which of the following was the most important reason for visiting the Mt. Rogers NRA? (*Check only one category.*)

- I went there because I enjoy the place itself
- I went there because it's a good place to do the outdoor activities I enjoy
- I went there because I wanted to spend more time with my companions

4a. What activities did you or any group member participate in during your visit to Mr. Rogers? (*Check all that apply.*)

- | | |
|-----------------------------------------------------|-------------------------------------------------|
| <input type="checkbox"/> Auto/RV camping | <input type="checkbox"/> Swimming |
| <input type="checkbox"/> Backcountry camping | <input type="checkbox"/> Canoeing (lake) |
| <input type="checkbox"/> Nature hikes | <input type="checkbox"/> Sailing |
| <input type="checkbox"/> Day hiking | <input type="checkbox"/> Picnicking |
| <input type="checkbox"/> Backpacking | <input type="checkbox"/> Photography |
| <input type="checkbox"/> Horseback riding | <input type="checkbox"/> Museums/historic sites |
| <input type="checkbox"/> On-road bicycling | <input type="checkbox"/> Spending time alone |
| <input type="checkbox"/> Off-road bicycling | <input type="checkbox"/> Off-road vehicle use |
| <input type="checkbox"/> Fishing (Creek/River) | <input type="checkbox"/> Socializing |
| <input type="checkbox"/> Pre-season scouting | <input type="checkbox"/> Special events |
| <input type="checkbox"/> Hunting | <input type="checkbox"/> Viewing scenery |
| <input type="checkbox"/> Collecting forest products | <input type="checkbox"/> Viewing wildlife |
| <input type="checkbox"/> Visitor center | <input type="checkbox"/> Other, please describe |

4b. Circle the activity in the list above that was the most important to you on this visit.

5. For the activity you circled in Question 4:

a. How would you rate yourself as a participant in this activity? (*Circle only one.*)

| | | | | | | | |
|-----------------|---|---|---|---|---|---|---------------|
| Beginner | | | | | | | Expert |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | |

b. How important is the Mt. Rogers NRA to your participation in this activity? (*Circle only one.*)

| | | | | | | |
|-----------------------------|---|---|---|---|---|----------------------------|
| Not at All Important | | | | | | Extremely Important |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

c. How many hours did you spend participating in this activity during your Mt. Rogers visit?

_____ Hours

6. The following statements relate to your involvement in the same activity as Question 5. The statements sound pretty close to each other, so please read each one carefully and respond to each one as honestly as you can. *(Please circle the appropriate number next to each statement.)*

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---------------------------------------------------------------------------------|--------------------------|-----------------|----------------|--------------|-----------------------|
| I have little or no interest in this activity | 1 | 2 | 3 | 4 | 5 |
| This activity says a lot about who I am | 1 | 2 | 3 | 4 | 5 |
| You can tell a lot about a person by seeing them participate in this activity | 1 | 2 | 3 | 4 | 5 |
| This activity is very important to me | 1 | 2 | 3 | 4 | 5 |
| This activity offers me relaxation when pressures build up | 1 | 2 | 3 | 4 | 5 |
| Participating in this activity is one of the most satisfying things I do | 1 | 2 | 3 | 4 | 5 |
| When I participate in this activity I can really be myself | 1 | 2 | 3 | 4 | 5 |
| I find that a lot of my life is organized around this activity | 1 | 2 | 3 | 4 | 5 |
| This activity has a central role in my life | 1 | 2 | 3 | 4 | 5 |
| Participating in this activity is one of the most enjoyable things I do | 1 | 2 | 3 | 4 | 5 |
| I enjoy discussing this activity with my friends | 1 | 2 | 3 | 4 | 5 |
| When I participate in this activity others see me the way I want them to see me | 1 | 2 | 3 | 4 | 5 |
| Most of my friends are in some way connected with this activity | 1 | 2 | 3 | 4 | 5 |

7. Please list other destinations (e.g., cities, parks, relatives, etc.) that you visited during this trip to Mt. Rogers NRA. If you visited more than 4 other destinations, list only the 4 closest to Mt. Rogers NRA.

| Destination | City/State | Date |
|-------------|------------|-------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

Your Expenditures Associated with Your Visit

8a. Which of the following best describes how you handled your expenses for your trip to the Mt. Rogers NRA?

- _____ I paid all my expenses and the expenses of _____ other people (*Please indicate number of people.*). (*In part B & C below, please report all of these expenses.*)
- _____ I paid all my own expenses. (*Please report your expenses in part B.*)
- _____ I shared expenses. (*In part B, please indicate your personal expenses & your portion of the shared expenses.*)
- _____ Someone else paid expenses. (*Please go to Question 9 on the next page.*)

8b. In the spaces provided, please list your estimated expenses while on your trip to the Mt. Rogers NRA. For each type of expense, please indicate the amount you spent in the two zones shown on the map on the opposite page. Indicate the amount you spent in (a) Mt. Rogers and vicinity and (b) outlying areas surrounding Mt. Rogers including the interstate highway communities shown on the map.

| TYPE OF EXPENSE | Zone A Mt. Rogers and Vicinity | Zone B I-81 & I-77 Corridor |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------|
| Restaurants (including fast food, sit down, etc.) | _____ | _____ |
| Food and beverage in retail stores | _____ | _____ |
| Retail purchases during trip (personal items, film, souvenirs, etc.) excluding durable purchases such as equipment | _____ | _____ |
| Lodging Expenses: | | |
| Hotel/motel | _____ | _____ |
| Camping | _____ | _____ |
| Other | _____ | _____ |
| Auto Expenses: | | |
| Gas and oil | _____ | _____ |
| Repairs/service | _____ | _____ |
| Parking and tolls | _____ | _____ |
| Fees at other attractions/entertainment | _____ | _____ |
| All other expenses for this trip (program fees, licenses, rental fees for bikes, horses, etc.) Please specify: | _____ | _____ |

8c. Please estimate the total amount spent on restaurants, food, lodging, travel (airfare, busfare, gas, etc.), gifts/souvenirs, and fees for the entire trip from the time you left home until the time you returned home. (If you shared expenses, please report your personal expenses and your portion of the shared expenses.)

\$ _____

Your Feelings About Your Recent Mt. Rogers NRA Visit

9. Please rate each item listed. First rate the *importance* of each item in your decision to visit Mt. Rogers. Rate importance in the IMPORTANCE block. Then, rate your satisfaction with each item at Mt. Rogers NRA. Rate satisfaction in the SATISFACTION block.

| | Importance | | | | | Satisfaction | | | | | |
|---------------------------------------------------|----------------------|---|---------------------|---|---|----------------------|---|---------------------|---|---|------------|
| | Not at all Important | | Extremely Important | | | Not at all Satisfied | | Extremely Satisfied | | | Don't Know |
| High degree of naturalness | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Large recreation area size | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Little evidence of land management activities | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Seeing or hearing few others | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Little evidence of other people's presence | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Low amount of rules, regulations and restrictions | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Low amount of development | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Flush toilets | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Scenery at this site | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Quality and variety of trails | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Information about the area | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Firewood | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Water/shore access | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| RV hookups | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Boating facilities | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Access for disabled | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |

| | Importance | | | | | Satisfaction | | | | | |
|------------------------------------------------|----------------------|---|---------------------|---|---|----------------------|---|---|---------------------|---|------------|
| | Not at all Important | | Extremely Important | | | Not at all Satisfied | | | Extremely Satisfied | | Don't Know |
| High solitude | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| High self reliance | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Closeness to nature | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Using outdoor skills | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| High risk and challenge | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Privacy of area | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Helpfulness of employees | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Variety of nearby activities | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Level of safety and security | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Maintenance of facilities | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Condition of natural features | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Reasonable fees | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Behavior of other people | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Number of other people | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Behavior of other people's pets | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Ease of locating site | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Appropriateness of facilities and developments | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Information on the history of the area | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Food/restaurants nearby | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Cabins for rent | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| Interpretive programs | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |
| High quality lodging | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | DK |

10. What additional facilities are needed or should be improved at this site? (Check all that apply)
 (Circle the facility which needs the most attention.)

- | | | |
|----------------------------------------|---------------------------------------------|----------------------------------------------|
| <input type="checkbox"/> Picnic sites | <input type="checkbox"/> Restrooms | <input type="checkbox"/> Information on area |
| <input type="checkbox"/> Campsites | <input type="checkbox"/> Drinking water | <input type="checkbox"/> Hiking trails |
| <input type="checkbox"/> RV hookups | <input type="checkbox"/> Parking | <input type="checkbox"/> Camp store |
| <input type="checkbox"/> RV dumps | <input type="checkbox"/> Water/shore access | <input type="checkbox"/> Visitor center |
| <input type="checkbox"/> Nature trails | <input type="checkbox"/> Boating facilities | <input type="checkbox"/> Handicap access |
| <input type="checkbox"/> Other _____ | <input type="checkbox"/> Other _____ | <input type="checkbox"/> Other _____ |

11. Please indicate your overall feelings about the quality of your visit to the Mount Rogers NRA.
 (Circle one.)

- | | | | | | | |
|-----------------------------------|-------------|-----------------|----------------|-----------------|-------------|--------------------------------|
| Extremely Dissatisfied | Very | Somewhat | Neutral | Somewhat | Very | Extremely Satisfied |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

12. How would you rate Mt. Rogers compared to other similar recreation sites that you may have visited in the past? (Circle one.)

1. Much better
2. Slightly better
3. Same
4. Slightly worse
5. Much worse
6. Have not visited a similar recreation site

13. How does Mt. Rogers rate compared to what you expected? (Circle one.)

1. Much worse than I expected
2. Somewhat worse than expected
3. About what I expected
4. Somewhat better than expected
5. Much better than expected

14. Was this visit worth your time and effort? (Circle one.)

1. Definitely not worth my time and effort
2. Not quite worth my time and effort
3. Just worth my time and effort
4. Worth somewhat more than my time and effort
5. Definitely well worth my time and effort

15. How did each factor contribute to your enjoyment of this area?

| | Added a Lot to My Enjoyment | | | | Neither | | | Subtracted a Lot from My Enjoy- ment | |
|----------------------------------------------------|-----------------------------------|----|----|----|---------|----|----|-----------------------------------------------|----|
| | +4 | +3 | +2 | +1 | 0 | -1 | -2 | -3 | -4 |
| My level of skill in outdoor activities | +4 | +3 | +2 | +1 | 0 | -1 | -2 | -3 | -4 |
| The extent of my knowledge of Mt. Rogers NRA | +4 | +3 | +2 | +1 | 0 | -1 | -2 | -3 | -4 |
| The effort I put into planning this trip | +4 | +3 | +2 | +1 | 0 | -1 | -2 | -3 | -4 |
| Luck that the conditions were right | +4 | +3 | +2 | +1 | 0 | -1 | -2 | -3 | -4 |
| The quality of the natural resources of the area | +4 | +3 | +2 | +1 | 0 | -1 | -2 | -3 | -4 |
| My companions on this trip | +4 | +3 | +2 | +1 | 0 | -1 | -2 | -3 | -4 |
| The way this area is managed by the Forest Service | +4 | +3 | +2 | +1 | 0 | -1 | -2 | -3 | -4 |
| The time we selected to come here | +4 | +3 | +2 | +1 | 0 | -1 | -2 | -3 | -4 |
| The attitude of the local community | +4 | +3 | +2 | +1 | 0 | -1 | -2 | -3 | -4 |
| The services available in the local area | +4 | +3 | +2 | +1 | 0 | -1 | -2 | -3 | -4 |

16. Please rate on the scale below how each of the following sets of statements describes your overall feelings about your visit to this site? (Circle one number for EACH set of statements).

| | | | | | | | | |
|--------------------------------------------------------|---|---|---|---|---|---|---|------------------------------------------------------|
| One of the best times ever | 1 | 2 | 3 | 4 | 5 | 6 | 7 | A bad time which I would like to forget |
| This visit was so good I will come back again if I can | 1 | 2 | 3 | 4 | 5 | 6 | 7 | This visit was very poor; I will not come back again |

**Your General Feelings About the Mt. Rogers
National Recreation Area**

17. Please indicate the extent to which each statement below describes your general feelings about Mt. Rogers NRA. *(Circle the number that best describes how you feel about each statement.)*

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|--------------------------------------------------------------------------------|------------------------------|-----------------|----------------|--------------|---------------------------|
| This place means a lot to me | 1 | 2 | 3 | 4 | 5 |
| This place is very special to me | 1 | 2 | 3 | 4 | 5 |
| This is my favorite place to go during my free time | 1 | 2 | 3 | 4 | 5 |
| Because of my lifestyle, this place is important to me | 1 | 2 | 3 | 4 | 5 |
| This place makes me feel like no other place can | 1 | 2 | 3 | 4 | 5 |
| No other place can compare to this area for what I like to do in my spare time | 1 | 2 | 3 | 4 | 5 |
| This place is me | 1 | 2 | 3 | 4 | 5 |
| Visiting this place helps me attain the life I strive for | 1 | 2 | 3 | 4 | 5 |
| When I am here, others see me the way I want them to see me | 1 | 2 | 3 | 4 | 5 |
| I can't imagine a better place for what I like to do | 1 | 2 | 3 | 4 | 5 |
| I find that a lot of my life is organized around this place | 1 | 2 | 3 | 4 | 5 |
| Coming here is one of the most satisfying things I do | 1 | 2 | 3 | 4 | 5 |
| I enjoy doing the type of things I do here more than in any other area | 1 | 2 | 3 | 4 | 5 |

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---------------------------------------------------------------------------------|--------------------------|-----------------|----------------|--------------|-----------------------|
| This place plays a central role in my lifestyle | 1 | 2 | 3 | 4 | 5 |
| I wouldn't substitute any other area for doing the type of things I do here | 1 | 2 | 3 | 4 | 5 |
| I am very attached to this place | 1 | 2 | 3 | 4 | 5 |
| Doing what I do here is more important to me than doing it in any other place | 1 | 2 | 3 | 4 | 5 |
| No other place can compare to this area | 1 | 2 | 3 | 4 | 5 |
| I identify strongly with this place | 1 | 2 | 3 | 4 | 5 |
| I feel like this place is a part of me | 1 | 2 | 3 | 4 | 5 |
| I think a lot about coming here | 1 | 2 | 3 | 4 | 5 |
| I get more satisfaction out of visiting this place than from visiting any other | 1 | 2 | 3 | 4 | 5 |
| This is the best place for what I like to do | 1 | 2 | 3 | 4 | 5 |
| I use this place to help define and express who I am inside | 1 | 2 | 3 | 4 | 5 |
| A visit to this place is a bit like giving a gift to oneself | 1 | 2 | 3 | 4 | 5 |

18. Listed below are statements about the relationship between humans and the environment. For each one, please indicate the extent to which you agree or disagree with it.

| | Strongly Disagree | Disagree | Unsure | Agree | Strongly Agree |
|----------------------------------------------------------------------------------------------|--------------------------|-----------------|---------------|--------------|-----------------------|
| We are approaching the limit of the number of people the earth can support | 1 | 2 | 3 | 4 | 5 |
| Humans have the right to modify the natural environment to suit their needs | 1 | 2 | 3 | 4 | 5 |
| When humans interfere with nature it often produces disastrous consequences | 1 | 2 | 3 | 4 | 5 |
| Human ingenuity will insure that we do NOT make the earth unlivable | 1 | 2 | 3 | 4 | 5 |
| Humans are severely abusing the environment | 1 | 2 | 3 | 4 | 5 |
| The earth has plenty of natural resources if we just learn how to develop them | 1 | 2 | 3 | 4 | 5 |
| Plants and animals have as much right as humans to exist | 1 | 2 | 3 | 4 | 5 |
| The balance of nature is strong enough to cope with the impacts of modern industrial nations | 1 | 2 | 3 | 4 | 5 |
| Despite our special abilities humans are still subject to the laws of nature | 1 | 2 | 3 | 4 | 5 |
| The so-called "ecological crisis" facing humankind has been greatly exaggerated | 1 | 2 | 3 | 4 | 5 |

| | Strongly Disagree | Disagree | Unsure | Agree | Strongly Agree |
|----------------------------------------------------------------------------------------------------|-------------------|----------|--------|-------|----------------|
| The earth is like a spaceship with very limited room and resources | 1 | 2 | 3 | 4 | 5 |
| Humans were meant to rule over the rest of nature | 1 | 2 | 3 | 4 | 5 |
| The balance of nature is very delicate and easily upset | 1 | 2 | 3 | 4 | 5 |
| Humans will eventually learn enough about how nature works to be able to control it | 1 | 2 | 3 | 4 | 5 |
| If things continue on their present course, we will soon experience a major ecological catastrophe | 1 | 2 | 3 | 4 | 5 |

Information About You

Demographic Characteristics:

19. Your age? _____ Years

20. Gender. (*Please check one.*)

Male Female

21. What is your ethnic origin? (*Check one.*)

White Hispanic Native American
 Black Asian Other

22. What is the last year of school you completed? (*Circle one.*)

| | | | |
|-----------------|-------------|-------------|-----------------|
| Grade School | High School | College | Graduate School |
| 1 2 3 4 5 6 7 8 | 9 10 11 12 | 13 14 15 16 | 17 18 19 20 21+ |

23. How many people live in your household (at home), including yourself?
_____ People

24. How many children under 6 years old?

_____ Children

25. How many are children between 6 - 18 years old?

_____ Children

26. In which of the following kinds of places did you spend the most time while growing up (to age 18)? *(Please mark only one answer.)*

_____ On a farm or ranch

_____ Rural or small town (Under 1,000 population)

_____ Town (1,000 - 5,000 population)

_____ Small city (5,000 - 50,000 population)

_____ Medium city (50,000 - 1 million population)

_____ In a major city or metropolitan area (over 1 million people)

27. In what type of community do you now live?

_____ On a farm or ranch

_____ Rural or small town (Under 1,000 population)

_____ Town (1,000 - 5,000 population)

_____ Small city (5,000 - 50,000 population)

_____ Medium city (50,000 - 1 million population)

_____ In a major city or metropolitan area (over 1 million people)

28. What is your approximate total household income before taxes?

___ under \$10,000

___ \$40,000 - \$49,999

___ \$80,000 - \$89,999

___ \$10,000 - \$19,999

___ \$50,000 - \$59,999

___ \$90,000 - \$99,999

___ \$20,000 - \$29,999

___ \$60,000 - \$69,999

___ \$100,000 or more

___ \$30,000 - \$39,999


___ \$70,000 - \$79,999

Thank you for your help!

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: Department of Agriculture, Clearance Office, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Management and Budget, Paperwork Reduction Project (OMB#0596-0108 Exp. 5/31/96, Washington D.C. 20503).

VITA

Andrew Justin Mowen was born in Waynesboro, Pennsylvania on April 12, 1970. He was a 1988 graduate of theGreencastle-Antrim High School in Greencastle. In 1992, he received a B.S. with honors in Leisure Studies from the Pennsylvania State University. He has worked as an environmental and historical interpreter throughout his undergraduate education. Since 1992, he has studied marketing principles while enrolled in the Recreation program within the College of Forestry at the Virginia Polytechnic Institute and State University.



Andrew J. Mowen