May 17, 1973

To the Graduate Council:

I am submitting herewith a thesis written by Gary G. Marsh entitled "Hikers in the Great Smoky Mountains National Park - Their Attitudes, Characteristics, and Implications for Management." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Forestry.

Major Professor

We have read this thesis
and recommend its acceptance:

Accepted for the Council:

Vice Chancellor for
Graduate Studies and Research

HIKERS IN THE GREAT SMOKY MOUNTAINS NATIONAL PARK - THEIR ATTITUDES, CHARACTERISTICS, AND IMPLICATIONS FOR MANAGEMENT

A Thesis

Presented to

the Graduate Council of

The University of Tennessee

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

---

by

Gary G. Marsh

June 1973

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And to the author's wife, Joleen, for her constant faith, encouragement, and understanding, I dedicate this thesis.

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ABSTRACT

The main objective of this study was to obtain information about trail users, primarily hikers, in the Great Smoky Mountains National Park (GSMNP), which would aid decision-makers in managing the wilderness resource for optimum benefits from hiking trails. Information was gathered by the use of a questionnaire to determine various socio-economic characteristics of users, their motivations for hiking, and their attitudes toward trail use and management within the GSMNP.

The questionnaire was administered in a personal interview with respondents as they were hiking on selected trails within the park. Five-hundred and fifty-eight interviews were completed at eleven sampling locations within the park in five sampling periods.

Chi-square tests were used to test various relationships of socio-economic data, user preferences, and attitudes toward management of the resource area. In most cases simple frequency distributions and percentages sufficed.

Hikers tended to travel in small groups usually consisting of three to four members per party and were generally young to middle-aged adults. Overnight hikers' length of stay was generally four to five days on trips into the backcountry. The study supported the findings about many of the socio-economic characteristics of hikers in other wilderness-type areas. Users tended to have college educations, have higher incomes in comparison to the regional population, and have urban residences. Hikers were aware of other hiking areas and opportunities other than the GSMNP but hiked infrequently in these other areas. The

majority of users spent over half of their total hiking experience within the GSMNP. Accessibility, uniqueness of the area, and certain status motive preferences were prime motivational factors of hikers coming to this National park. Attitudes toward limiting use of overnight shelter facilities within the backcountry were generally favorable. Horse use of trails and hiking on these same trails were generally thought to be noncompatible uses among the respondents interviewed.

Certain implications for management were derived from this study. Educational programs should be developed and coordinated among all recreational organizations and agencies. Redistribution of use within the park could possibly be accomplished with such measures as: closing Highway 441 to traffic within the park and providing public conveyance; and providing exclusive dayhiking trails by using proper site design, planning, and reinforcing certain trails. Further research, including in-depth studies of hikers, is needed to determine various psychological and physical carrying capacities of the hiking resource. Trail management will continue to be less than fully effective and efficient without more complete knowledge about the resource and the people who use it.

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CHAPTER I

INTRODUCTION

> For me and for thousands with similar inclinations the most important passion of life is the overpowering desire to escape periodically from the clutches of a mechanistic civilization. To us the enjoyment of solitude, complete independence, and the beauty of undefiled panoramas is absolutely essential to happiness (Marshall, 1901-1939).

One recurring motivational force that seems to characterize the wilderness recreational user is the desire to escape from his civilized environs and move into a more pristine existence. This urge to get up and get away explains many of the visits to our National parks and other various recreation areas in the United States.

This motivation is not only unique for the hiker but is common to other participants in outdoor recreation. However, the number of hikers are increasing rapidly. The impact of this increased use is so great in some areas that recreation resource administrators, planners, researchers, and citizen groups are constantly searching for strategies of management to maintain the hiking experience and to protect the natural resource which supports this experience.

Growth in recreational use of wild lands and primitive areas has steadily increased since 1946. In 1959, the Wildland Research Center, at the University of California, in their report to the Outdoor Recreation Resources Review Commission (ORRRC), projected nearly a tenfold increase in visits to wilderness areas by the year 2000 (ORRRC, 1962b). This projection was based on use statistics from the

U. S. Forest Service and indicated about a 6 percent annual growth rate for National Forests. By 1967, however, a fourfold increase in visits had occurred in Forest Service wilderness areas in only eight years, or a 10 percent annual growth rate.

According to Lucas (1971a) hiking increased 26 percent from 1960 to 1965, and a projection by the Bureau of Outdoor Recreation (BOR) (1967) shows that hiking will increase by 78 percent from 1965 to 1980. While projected use estimates must be considered carefully, they are a necessary input for resource management.

Social and economic factors affect this increasing leisure activity called hiking. Studies of wilderness users show that people with higher incomes (over $10,000), college educations, and urban residence occur with more frequency than in other populations (Stankey, 1971a). Projections by the Bureau of the Census suggest an increase in these particular socio-economic characteristics in the United States population (U. S. Census, 1971a). Hence, if there are in fact relationships between wilderness use and these socio-economic characteristics, an increasing trend in wilderness use could be expected.

Recreation facilities are being affected by the impacts of these increased numbers of participants and their uses. The Great Smoky Mountains National Park (GSMNP), the nation's most visited National park, was visited by over eight million people in 1972--a 12 percent increase over 1971. Incorporated in this increase was a 10 percent increase in hiking and a 19 percent increase of overnight camping in the backcountry of the park. As trail use increases, overcrowding, soil and vegetation deterioration along trails, and a consequential

reduction in the recreation experience for the user will likely result.

Resource managers from different agencies, which have recreation use responsibilities, must adjust and coordinate their decision-making process to efficiently accommodate aggregate recreation demands in a certain region. Input from hikers, i.e., opinions, desires, and satisfactions correlated with specific management objectives must be considered in the formulation of guidelines to alleviate trail overuse. This input can be gathered in various ways, but one technique that has proven successful is to analyze the user and identify the various factors which influence his activities. Recommended alternatives should be based upon research implications and results.

The primary objective of this study was to obtain information from trail-users (hikers) which would aid decision-makers in managing the wilderness resource for optimum benefits from hiking trails. Information was gathered to determine the socio-economic characteristics of users, their motivations for hiking, and their attitudes about trail use and management. It is anticipated that a specific benefit of this study will be to supply information which will aid in setting guidelines for the management of hiking trails in the Great Smoky Mountains National Park.

CHAPTER II

REVIEW OF LITERATURE

A. A Workable Definition of Wilderness

Early in American history, the word "wilderness" was viewed in a different way than we perceive it today. In the period of early American settlement, approximately the 16th and 17th centuries, wilderness evoked attitudes of fear and confusion. These wild, untamed lands were looked on as physical barriers to cross and as elements of the physical environment to remove or eliminate. These latent fears seemed justified in their conception based upon certain Judeo-Christian traditions which contained certain religious attitudes toward this concept of "wilderness."

The Wildland Research Center, of the University of California, in analyzing the Biblical use of "wilderness" cited three essential qualities: (1) it was virtually uninhabited; (2) it was desolate, occasionally savage; and (3) it was vast (ORRRC, 1962b). The pioneer gradually changed in his outlook and had a different view of these lands. Rather than barriers to cross and lands of desolation, these areas, especially to the west, became the most resourceful areas of the United States. This conception, along with certain cultural and literary influences, transformed wilderness from an element to be removed to one of preservation.

The Federal government provided one of the first steps in setting aside areas for public use with the establishment of Yellowstone National

Park in 1872 (Dana, 1956). Yellowstone, while not set aside specifically for wilderness, influenced other significant Congressional action in setting aside similar areas. Two of these Congressional acts bear mentioning because of the magnitude they had upon defining the wilderness resource.

The organic act of August 25, 1916, which led to the establishment of the National Park Service, specified the purpose of National parks and monuments:

> . . . which purpose is to conserve the scenery and the natural and historical objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations (ORRRC, 1962b).

Subsequently the National Park Service defined wilderness and expressed two major concepts about it:

> We accept man using the wilderness for recreation; and we accept a trail, a simple campsite, or even a drift fence or fire lookout, so long as the predominant character of wilderness remains. We also accept certain management and protection practices, so long as they are confined to minimizing the effect of man, and do not interfere with the normal interplay of natural processes. This definition is sufficiently flexible to adapt to peculiar local conditions, and it recognizes that natural processes, in time, can restore to wilderness, areas previously abused and impaired. This kind of definition, based upon the physical characteristics, the ecology of the area, is, perhaps, the best basis for determining management, use, and protection practices.
>
> Wilderness also needs to be regarded as a quality--defined in terms of personal experience, feelings, or benefits. In this, it is even more difficult to define wilderness in exact terms that will satisfy the sensibilities of all people. But, certain general qualities must be present to provide that type of experience which the national parks were established to perpetuate. . . . In this sense, wilderness does not necessarily require vast areas of undeveloped or rugged topography, dense forests unopened by modern man, or a wild jumble of mountain peaks. The quality of wilderness is experienced within an expansive roadless area, in a narrow glen, or even close to a major highway, if shielded from the effects of mechanized civilization (ORRRC, 1962b).

In this sense, wilderness is an ecological condition as well as a state of mind or individual perception. Both concepts are important and are functional both in an operational context and in protection, planning, and evaluation of benefits to the user.

The Wilderness Act, signed on September 3, 1964, has purposes common to those of the National Park Service as it states that wilderness area:

> . . . shall be administered for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness . . . (U. S. Congress, 1964).

Also, the act provides a definition of wilderness:

> . . . an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain . . . an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvement or human habitation, which is protected and managed so as to preserve its natural conditions . . . (U. S. Congress, 1964).

Although it is not as flexible a tool for management as the National Park Service's organic act, this act attempts to define areas which may be classified as wilderness and designate the types and levels of recreational use they should attempt to provide. All of the National parks are qualified for study under this act. These parks represent some 19.8 million acres, some of which will not qualify due to prior developments and roads (Stankey, 1971a).

It was not the purpose to compare these two pieces of legislation but to reveal the current definitions pertaining to wilderness. Many

controversial issues concerning various interpretations of these acts could be discussed.

B. Related Recreation Research

Much of the recent research on hiking clientele and outdoor recreation quality has been conducted in wilderness areas, especially in the National forests of the West and North Central parts of the United States. Two studies in the South have pointed up various characteristics of Appalachian Trail users and campers in East Tennessee, respectively (Murray, 1972; McCall, 1972). These two studies influenced the planning and design of the current study and will be referred to when applicable.

Lucas (1971a) infers managers must know the character of change under specified levels of use and how this change in the ecosystem relates to management objectives. However, as user impacts increase one must also understand the motivations and perceptions of the user. What management perceives and what the recreationist perceives may be at opposite ends of the spectrum (Lucus, 1964; Hendee and Harris, 1970a). In a National forest campground study, Lucas (1970) found that recreation participants consistently rated the quality of certain sites higher than administrators did. This may indicate that what the user seeks in his experience may be entirely different from what the administrator considers to be an acceptable environment for the visitor.

Studies dealing with motivations of backcountry users point to socio-psychological complexities of wilderness users (Catton, 1969; Shafer and Mietz, 1969; Hendee et al., 1971a). Catton (1969) mentions some similarities, that seem to be a common thread among user groups.

He states that visitors are attracted to the natural environment for specific reasons rather than being repulsed from their urban environments and that users tend to use popular areas as stepping stones enroute to these areas. Hendee (1967) studying recreationist's attributes and preferences found those who preferred Forest Service areas were most likely to attribute their choice to the abscence of people and to features of the natural environment, in that order.

Conversely, National Park wilderness users were cited as recognizing features of the natural environment first and the insulation from people second. This indicates a sharp contrast among these two user groups that is not fully understood. Hendee (1969a) and Catton (1969) point out one possible reason for this phenomenon; they state that these differences might be learned through experiences developed in rural and urban situations. Urbanized recreationists (having preservationist attitudes) were shown to pursue National Park backcountry areas while National Forest primitive area users tended to have a rural (utilization and consumptive attitudes) background.

Studies have also been conducted dealing with the complex and dynamic aspects of recreational crowding. One of these aspects is carrying capacity (Lucas, 1964c; Wagar, 1964; Stankey, 1971a, 1971b; Held et al., 1969; and Lime, 1971). A complex and multidimensional term, carrying capacity has its place in measurement of impact and determination of visitor tolerance to use restrictions. Wagar (1964) in discussing the effects of crowding which influence quality of the recreation experience expressed various alternatives based on levels of use. He states that use which would result in excessive damage to

the resource base or the quality of experience for the user must be handled in a discreet yet scientific manner. Some alternatives suggested by Wagar are: (1) site management, (2) modification of visitor behavior through direct regulation; and (3) other indirect or subtle measures to change visitor behavior. In the Boundary Waters Canoe area, Lucas (1964a) delineated certain user groups (canoeists and motor boat owners) and their reaction to overcrowding. Stankey (1971a) found that tolerance to overcrowding was not only a function of the level and types of use encountered but also of where and when trail encounters took place.

Various methods have been used to gather vital input data from the user within wilderness areas. James and Henley (1968) conducted pilot sampling studies to estimate dispersed use on large, general recreation areas. Their techniques incorporated interviewing participants at established checkpoints as they left nonwilderness recreation areas. Wenger and Gregerson (1964a, 1964b) have conducted research showing the correlation between self-registration rates and various automatic counters on wilderness trails. These studies point out the need for continuous, economic, and continuous trail input data gathering mechanisms. Lucas et al. (1971b) points out that although more expensive, the most accurate information of wilderness use would probably be from the use of permits administered by area managers. Hendee and Lucas (1973) also support and recommend a mandatory wilderness permit system to gather vital input from users. Overall benefits seem to outweigh the costs incurred of such a system. Vital information is needed not only for managers, but to influence visitor behavior and control overuse.

C. Factors Influencing Wilderness Participation

No one socio-economic factor can fully explain wilderness use or user preferences and motivations; however, by evaluation of various data inputs we can observe significant trends. Stankey (1971c) discussed various myths of wilderness users and related research findings of other studies to dissolve such myths as: Users have inordinate amounts of leisure time, wilderness trips are lengthy affairs, and various other misunderstood socio-economic variables. Merriam and Ammons (1967) found that hiking trips averaged less than five days for certain wilderness areas in the Pacific Northwest. Lucas (1963) found that less than 10 percent of users in the Mount Marcy area, New York, stayed over one week. Burch and Wenger (1967) presenting additional evidence contradicted the theory that wilderness users require inordinate amounts of leisure time. Hendee (1968a) reported frequent, short wilderness trips to be characteristic. Lucas (1971b) showed that over 80 percent of all visitors left the area the same day upon entrance in the Mission Mountains Primitive Area in Montana. Most researchers concluded that length of stay was more a function of activities provided and of the area's size rather than of the user's available time.

Variables such as income, education, and occupation have also been used to categorize certain wilderness users. Hendee (1967) reported that recreationists who preferred primitive areas tended to be of a higher social class than car campers. For example, he found that of 2,500 campers in the Pacific Northwest, 50 percent were not among the top 10 percent of the United States population in terms of educational

attainment. Sixty percent and more than 50 percent, respectively, were not among the top 25 percent of the United States population when compared to income and professional occupational classifications. Higher education, income, and occupational attainment were represented by only 50 percent of these users. Burch and Wenger (1967), revealed that nearly 40 percent of the users, which represented 19 percent of the state's population, had incomes over $9,000 annually. Data gathered by the Wildland Research Center revealed that 33 percent of the persons visiting in three wilderness areas were reported to have family incomes which exceeded $10,000; in 1960 only 13 percent of the incomes in the United States were over $10,000 (ORRRC, 1962b). But more importantly, they concluded that wilderness use was not so much dependent on high income as it was on recreationist's taste preferences.

Education is closely correlated with income and college graduates frequently constitute a large number of the wilderness users (Hendee, 1968a; Burch and Wenger, 1967). Consequently, Stankey (1971c) stated education may be a stronger determinant in changing recreational preferences than income.

As mentioned previously, hiking participation has increased but so have "walking for pleasure" and "nature walks." They too have their impact upon trail hiking use. While hiking accounted for 10 million participants in 1965 (BOR, 1962b), 7 percent of the United States population, Lucas (1971a) reported 68 million people walked for pleasure that same year which represented 48 percent of the population. Nature walks were taken by 16 percent of the population or 20 million participants (Lucas, 1971a). Some hikers undoubtedly are walkers for

pleasure or nature walkers, and vice versa. Lucas (1971a) also related nature walk participation to educational levels. College graduates were found to participate twice as much in nature trail experiences as were high school dropouts; and to participate more than four times as much as people with eight years or less education. If this trend is in fact valid then education levels appear to be good indicators of demand for wilderness type opportunities. Harry et al. (1969), stated:

> . . . since upper-middle class occupations and high education are statistically associated with an urban way of life, it appears that an appreciative attitude towards nature is urban-based and will become more common as America continues to urbanize its way of life.

Hendee (1969d) similarly stated that if professionalization of labor, increasing education, and increased recreation experience may result in even a greater demand for appreciative uses of the natural environment; i.e., primitive camping, hiking, photography, nature study, and interpretation.

Burch and Wenger (1967) suggested that progressively primitive camping styles are related to the amount of childhood camping experience. These authors suggested the possibility that persons who, as children, participated in automobile camping are more likely to become backcountry campers as adults. Seventy percent of wilderness users reported by Hendee et al. (1968a) were introduced to that type of experience in their childhood. Other authors, Lucas and Krutilla, according to Hendee (1969d) suggested experience gained in beginning forms of activity, such as car campers, may lead to greater "induced demand for wild, primitive, and wilderness related activities." If this is the case, and camping participation increases by 78 percent from 1965 to 1980 (ORRRC, 1967e),

then demands for wilderness and natural environment activities will increase substantially.

Certainly, all these factors plus others indicate various impacts upon outdoor recreation and especially natural areas. Managers, administrators, and planners need to consider these factors along with their many alternatives in decision-making. Resource managers should consider the programs and guidelines they are currently using to affect the user that visits a particular area. Communication, education, research, and intra-agency coordination are all processes to be evaluated when making any determination which affects the visitor. Direct controls and restrictions may be eventually necessary for some resource areas in order to distribute overuse internally and perhaps even externally over time and space. It these controls are to be effective, understanding of the user is essential to management.

CHAPTER III

DESCRIPTION OF STUDY AREA

A. Location and Physiography

The Great Smoky Mountains National Park (GSMNP) extends northeast along the common border of Tennessee and North Carolina from the Little Tennessee River to southwest of Interstate 40. This 800 square mile area of the GSMNP is located in sections of Blount, Sevier, and Cocke Counties in Tennessee, and Swain and Haywood Counties in North Carolina (Figure 1). It is approximately 40 miles southwest of the metropolitan area of Knoxville, Tennessee (population 368,000), and approximately 30 miles due west of the metropolitan area of Asheville, North Carolina (population 145,000). U. S. Highway 441 bisects the park while Tennessee State Routes 32 and 73 parallel the northern boundary. From the East: U. S. Highway 19, Blue Ridge Parkway, and Interstate 40 are all accessible routes to the park. Other routes include North Carolina State Route 28, U. S. 129, and Tennessee State Routes 72 and 73 all from the South and West. The 516,626 acres of the park include some 314,860 acres that qualify for wilderness areas (ORRRC, 1962b). Over 650 miles of horse and foot trails wind through this mountainous terrain (National Park Service, 1969).

This area is located in the southern division of the Appalachian Highlands. This section is a part of Unaka Mountain Range, which is a part of the Blue Ridge Province known as the Great Smoky Mountains.

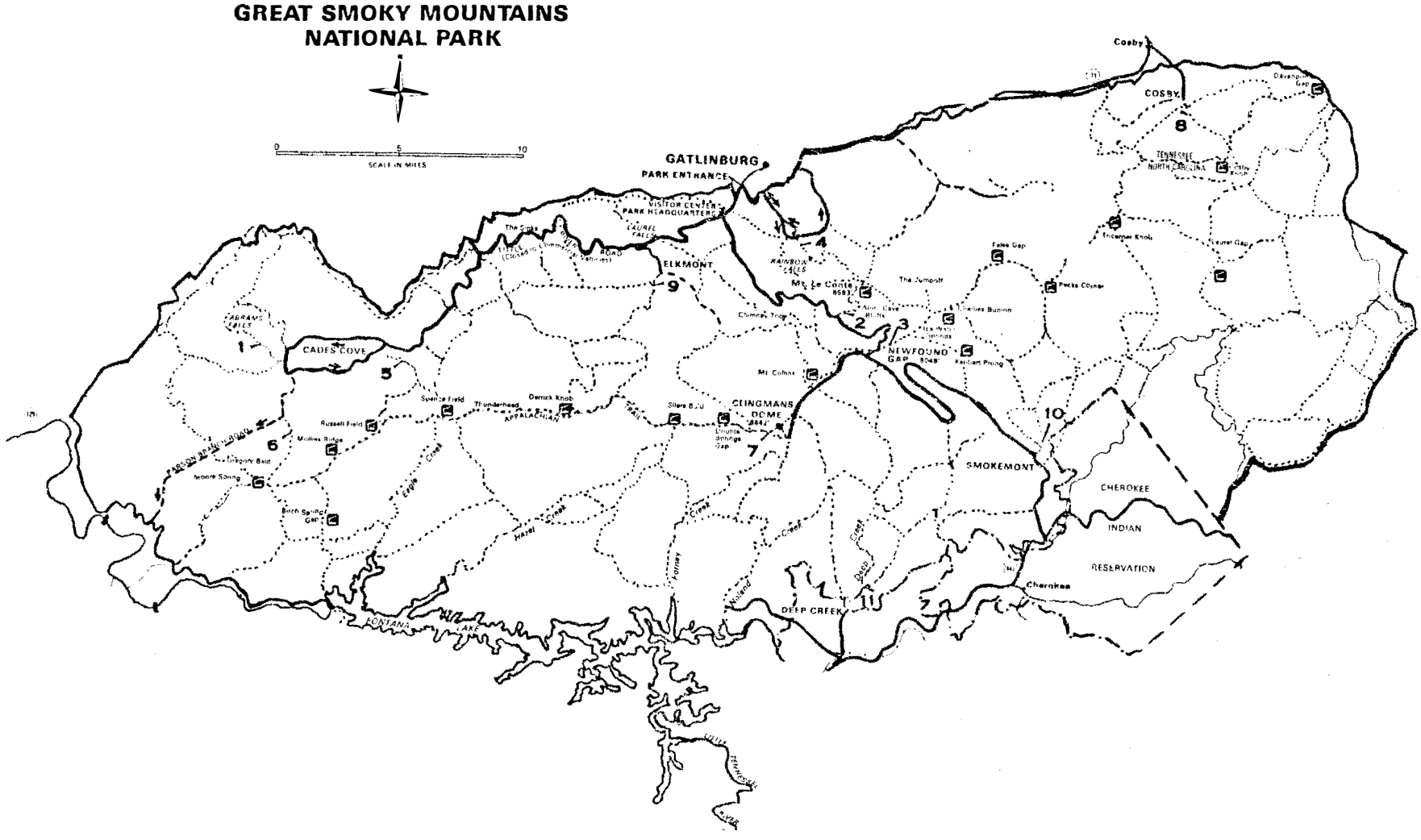


Figure 1. Trail map of the GSMNP showing sampling locations.

NOTE: Used by permission of the Superintendent, GSMNP.

Typical of this rugged division are the steep-sloped, V-shaped valleys and narrow winding ridge crests with sharp peaks. Elevations in the GSMNP range from 888 feet above sea level where Abrams Creek flows into Chilhowee Lake, to 6,643 feet on Clingmans Dome, the second highest point in the eastern United States (King et al., 1969). The United States Fish and Wildlife Service lists 72 species of fishes, 333 streams, and 735 fishable miles in the park. The streams dissect the park and drain into the Oconaluftee and Tuckasegee Rivers in North Carolina and Little Pigeon, Little River, and Little Tennessee Rivers in Tennessee (National Park Service, 1969).

B. Geology and Soils

The GSMNP is underlain by rocks classified as belonging to the Great Smoky formation of the Ocoee series of late Precambrian age. These are sedimentary rocks of unusual complexity that have been metamorphosed and greatly folded and faulted. The rocks are principally composed of graywacks (quartz, feldspar, and slate fragments), with lesser amounts of slate, schist, and limestone (King et al., 1968; TVA et al., 1967).

The soils of these areas, typical of the soils of the upland, were derived from the underlying bedrock. The majority of this soil is classified as the Ramsey Soil type (Ramsey slates, silt loam, very steep phase), and is derived from slates and quartzites. These Ramsey soils vary considerably in depth and have distinctively developed soil horizons. The deep soils occur in local alluvial deposits at the base of steep slopes and along drainageways, while the shallow soils occupy narrow ridgetops and the steeper slopes. Some characteristics of Ramsey soils

are their moderate natural fertility, medium to high acidity, rapid water percolation, and low water storage capacity (U. S. Forest Service, 1970). Cain (1973) found that the cove soils were moderately acid (pH 4.8-5.1), the middle slope soils intermediate in acidity (pH 4.1-4.3), and the ridge top soils highly acidic (pH 2.9-3.6).

C. Climate

The study area generally has a humid type of climate. There is, however, a marked variation in local climates due to the high relief of the mountainous terrain. Temperature decreases at the average rate of 2.23°F. per thousand feet rise in elevation. The higher peaks in the GSMNP average 10 to 15°F. cooler than the base of the mountain during the growing season. There is a marked contrast between the six warm months and the six cold months of the year with a rapid warming between April and May and a sharp cooling between October and November. The average temperatures for January and July are 39.3° and 73.6°F., respectively for the GSMNP (Shanks, 1954).

The precipitation at the base of the mountains is not too different from that of the adjacent valley areas. The precipitation at 4,500 to 5,000 feet elevation, however, is about 50 percent greater than at the base of the mountains. The summer season, especially the month of July, is the period of greatest precipitation, while the fall, especially November, is the driest time of the year. Annual precipitation ranges from 45 to 55 inches per year at the elevations of 2,150 feet above sea level at Gatlinburg, Tennessee, to more than 85 to 95 inches per year at an elevation of 6,643 feet at Clingmans Dome in the

GSMNP. The average annual precipitation on Clingmans Dome is the highest in the United States with the exception of the Northwest Coast (Shanks, 1954).

D. Vegetation

The vegetation of the Great Smoky Mountains is particularly rich in species and varied in community types. Stupka (1960) states that there are more than 1,300 varieties of flowering plants, almost 350 mosses and liverworts, 230 lichens, and more than 2,000 fungi in the GSMNP. Whittaker (1956) described vegetational variety by the use of 15 vegetation types which he derived from studying the vegetation along the environmental gradients of moisture and elevation. Shanks (1954) lumped the numerous specific vegetation types into six broad physiognomic types which are relatively distinct, which occupy obviously different sites, and which are characterized by marked differences in the minor vegetation. These six vegetation types include cove hardwood forests, hemlock forests, northern hardwood forests, spruce-fir forests, closed oak forests, open oak, and pine stands-heath balds. Figure 2 shows the general altitudinal and topographic position of these broad vegetation types and Table 1 shows each of the important tree species which make up each forest type. The effect of altitude is mainly on temperature and length of growing season, while effective moisture and soil depth are correlated with topographic position. Heath balds are considered as a separate vegetation type and grassy balds and fields are added to make a total of nine vegetation types. A total of 122 species of native trees grow in the GSMNP, more than any other National park.

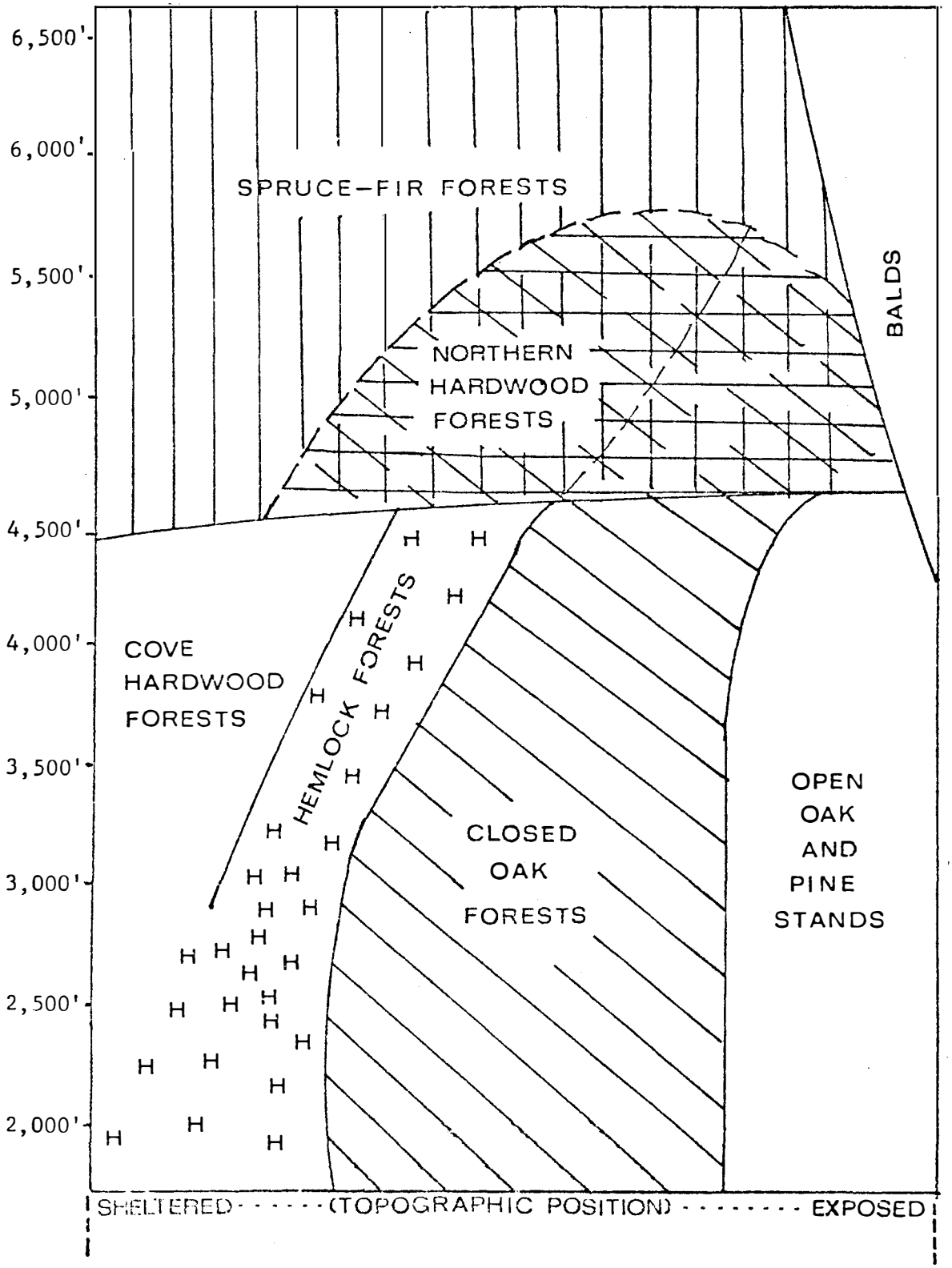


Figure 2. Vegetation pattern of the Great Smoky Mountains based on pattern diagrams by R. H. Whittaker, 1952.

NOTE: Used by permission of the Botany Department, The University of Tennessee, Knoxville.

TABLE 1

VEGETATION TYPES AND THEIR IMPORTANT TREE SPECIES
IN THE GREAT SMOKY MOUNTAINS*

Vegetation Type	Important Species
Cove hardwood	Eastern hemlock (Tsuga canadensis) Silverbell (Halesia monticola) Yellow buckeye (Aesculus octandra) Tulip poplar (Liriodendron tulipifera) Beech (Fagus grandifolia)
Hemlock	Eastern hemlock (Tsuga canadensis) Yellow birch (Betula alleghaniensis) Silverbell (Halesia monticola) Fraser magnolia (Magnolia fraseri) Rhododendron (Rhododendron spp.) Mountain laurel (Kalmia latifolia)
Northern hardwood	Beech (Fagus grandifolia) Yellow birch (Betula alleghaniensis) Yellow buckeye (Aesculus octandra) Sugar maple (Acer saccharum) Mountain maple (Acer spicatum)
Closed oak	White oak (Quercus alba) Chestnut oak (Quercus prinus) Northern red oak (Quercus rubra) Black oak (Quercus velutina) Pignut hickory (Carya glabra) Mockernut hickory (Carya tomentosa) Sourwood (Oxydendrum arboreum) Black locust (Robinia pseudoacacia)
Open oak and pine	Scarlet oak (Quercus coccinea) Virginia pine (Pinus virginiana) Pitch pine (Pinus rigida) Table mountain pine (Pinus pungens)
Spruce-fir	Red spruce (Picea rubens) Fraser fir (Abies fraseri)

*Used by permission of the Botany Department, The University of Tennessee, Knoxville.

SOURCE: R. E. Shanks, "Reference List of Native Plants in the Great Smoky Mountains." Botany Department, The University of Tennessee, Knoxville, 1954. (Mimeographed.)

CHAPTER IV

METHODOLOGY

A. The Questionnaire

The primary source of data for this study was obtained through a questionnaire and administered to trail users in the Great Smoky Mountains National Park at eleven selected sampling locations. This questionnaire (see Appendix A) consisted of four basic parts: (1) a description of the hiking group; (2) the experience and knowledge of the respondent in terms of the different hiking areas used and the frequency of hiking; (3) determination of motivations and attitudes pertinent to hiking; and (4) a standard socio-economic description of the respondent.

The personal interview method, although generally a costly procedure, was chosen for a number of reasons. This type of interview is found to be highly successful in determining user attitudes, perceptions, and behavior of people in their immediate environment (Festinger and Katz, 1953). Also the interviewer could explain certain questions and better interpret the respondent's answers. There was the additional advantage of observing trail conditions and hiking behavior while interviewing.

Design and Style

The structure of the questionnaire was influenced most by the information which was considered by park service officials as being

useful in planning and management and by other questionnaires used in similar recent studies.

Both "closed" and "open-end" questions were included. For the closed question the interviewer would check a pre-coded response on the questionnaire, while all open-end or free responses were recorded in full and coded at a later date. The open-ended type of question was used to record spontaneous responses and to measure the general "feeling" of users towards managerial controls.

Filter questions were included to exempt some respondents from answering certain questions inappropriate for them. Examples of these were: (1) only hikers that were aware of other hiking opportunities besides those in the GSMNP were asked about location and hiking frequency in these other areas; (2) only hikers with experience in trail shelter facilities could indicate their preference or optimum accommodation; and (3) only those hikers who would object to being re-routed were asked what they would do or where they would go.

Administration

Eleven trail sample locations were selected to get observations (see Figure 1, page 15). The criteria for selection of the locations were an estimated use level that would insure a reasonable number of observations per visit and a representative cross section of hikers within the park.

An observation was represented by a completed questionnaire administered to a "leader" of a hiking group by the interviewer in a personal contact. The husband was normally the leader in a family group.

Organized groups generally had a designated leader. In other groups the leader was selected, if at least 16 years of age, by the interviewer at random and asked for cooperation in being interviewed. There was a particular interest in sampling Scout clientele and since many Scouts have acquired some relative hiking knowledge and experience by the age of 16, each leader of the troop over 16 was interviewed.

Although the interviewer asked the questions and recorded the answers on the questionnaire sheet, bias introduced by complete reliance upon the group leader's response could not be totally eliminated. It is recognized that one person's attitudes are not necessarily held by all of the other members of the group, but for the purposes of this study the response by the leader was assumed to be representative of the entire group.

The three-page questionnaire was generally well-received and took approximately seven minutes to complete. Only eight groups, who were in a hurry or not interested, refused to stop and be interviewed.

Field interviews yielded 558 complete questionnaires in five different sampling periods. These periods will be discussed under sampling procedures.

B. Sampling Procedures

Sampling Locations

The 650 miles (approximately) of trails within the GSMNP presented many options for sampling locations, but the knowledge and aid of the GSMNP staff narrowed the array. They suggested certain trails as the best possible sampling locations and from these eleven

locations were chosen for use observations and interviews. Selection of trail sampling points were based on the probability of encountering at least five hiking parties per three-hour sampling period. These locations were situated far enough from entrance points to eliminate from sampling the casual tourist who takes a short walk onto trails. Hikers were interviewed only at a location where there was a natural resting place, scenic vista, or registration box so as not to sample exhausted or impatient hikers. For a description of each of these sampling locations see Appendix C.

Sampling Periods

1. April 1 through May 27, 1972. (Pre-testing and revision of questionnaire.)
2. June 7 through July 26, 1972.
3. July 27 through September 14, 1972.
4. August 16 through September 12, 1972. (Supplementary data.)
5. October 14 through November 7, 1972.

For specific calendar schedules see Appendix B.

The major periods of sampling were from June 7 through July 26 and July 27 through September 14, 1972. Also included in the sample were results of the pre-testing which were assumed to be valid observations and special stratum of October 14 through November 7 to test whether users in this period were significantly different from users in the main seasons. The supplementary data were gathered primarily to increase the sample size.

This sampling design was recognized as a cluster sample; i.e., respondents sampled from access points within a specific time frame, and certain losses in precision were not accounted for in the data analysis. The primary reason for this sample design was one of economic considerations due to lack of financing a single random sample.

Visitation to Sampling Locations (June 7 through September 14)

There were a total of eight visits to all but two of the eleven sampling locations during this 100-day main sampling period. These two locations were visited only seven times due to nonavailable half-days; i.e., too many location visits required for the half weekend days available in the calendar. These two locations were Alum Cave Bluffs and Deep Creek.

Stratification of Day Periods

In addition to the main sampling periods there was the additional stratification of weekends and weekdays. If an observation fell on Friday afternoon it was assumed to be a weekend observation. Holidays were also considered as weekend observations. Weekday is defined as Monday through Friday at noon, while weekend is defined as Friday noon through Sunday. Thus, each week had a possible nine sampling periods on weekdays and five sampling periods on weekends. Weekends were sampled approximately twice as heavily as weekdays. This gave a sampling intensity ratio of 1.7:1 for weekend days versus weekdays sampled. In some analysis, a weighting factor was included to account for this difference in sampling intensity.

Selection of Time Periods

The interviewer was stationed on each of these trail locations according to the corresponding calendar day and time. In sampling periods 2, 3, and 5 times were designated AM (9 a.m. through 12 noon) and PM (2 p.m. through 5 p.m.), while in sampling periods 1 and 4 random times were used because of pre-testing and the special circumstances of gathering supplementary data. The periods of 9 a.m. to 12 noon and 2 p.m. to 5 p.m. were mostly a function of travel time needed to arrive at locations and to travel from one location to another.

Sampling Selection Procedure

The specific procedure for sampling was accomplished in the following manner:

1. The eleven sampling locations were assigned a number.
2. Each weekday, weekend day, and holiday were given a number.
3. In assigning times, a coin was tossed for the first 50-day season and AM or PM was assigned for a particular day with a sampling location. For the second 50-day season times were purposely rotated as not to sample all locations in the morning (AM) or the afternoon (PM).
4. Each location was visited twice on weekdays and twice on weekend days within each 50-day season (including holidays, and special days) to give a total of 88 visits for the 100-day period. This is calculated by (two 50-day seasons X (two weekday visits + two weekend day visits) X 11 different sampling locations).

C. Statistical Analysis of Data

The primary method of analysis was using percentage and frequency distributions combined with a cross tabulation of independent variables against dependent variables. Hikers were divided into two groups based on whether they were a dayhiker or backpackers. Examples of independent variables were type of group, day of the week, length of stay, and specific sampling locations. Dependent variables consisted of user characteristics, attitudes toward certain questions, and other relevant hiking related questions.

Analysis was accomplished using an IBM 360/65 computer with programs from the Statistical Package for the Social Sciences (Nie et al., 1970).

The main statistical test employed was the Chi-square statistic, χ^2, which indicates whether certain observations differ from what is expected by chance at a particular level of significance. This test, sometimes regarded as a "goodness-of-fit" statistic, refers to an evaluation of the difference between sample observations and some hypothesized distribution of observations (Champion, 1970). No assumptions need to be made concerning the underlying distribution of the variables. In this study, a difference was considered significant if as large or larger departures from the expected frequencies could have occurred from chance not more than 5 percent of the time (0.05 significance level).

CHAPTER V

RESULTS AND DISCUSSION

Knowledge about the resource is the most important factor in managing any outdoor recreation area. This is especially true for wilderness or backcountry areas where ecosystems must be protected as well as enjoyed by various user groups. Consequently, any research study involving user input data is information to which the manger is better able to understand various clientele and how they are affecting the resource area. Socio-economic characteristics, motivations of the hiker, and attitudes of the user toward certain managerial controls are all important to the administrator who is involved in the decision-making process.

A. The Hiker

Although the respondents were divided into dayhikers and backpackers,[1] the term "hiker" will generally be used except when certain situations necessitate a differentiation between these two groups. The sample included more dayhikers than backpackers for each sampling period.

The demographic characteristics recorded for each respondent included: age, sex, marital status, parenthood, educational attainment, occupational status, and income distributions. Additional background

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[1]The term "backpacker" will be defined as a hiker within the GSMNP or passing through the boundary who stays one or more nights per trip.

information included childhood and present living environments, and state of residence.

Demographic Characteristics

Age. Respondents selected for interviewing were hikers at least 16 years of age or older. The age distribution for all respondents is shown in Table 2 and compared with that of the regional population (U. S. Census, 1972). Also, all ages within each respondent's group were obtained to compute an average age for all hikers (see Tables 26 and 27, Appendix F). A comparison of this sample population was made with the total regional population to observe significant differences between the two. Generally, hikers were in the young to middle-aged adult classification. The majority were between 22 and 50 years old, but the 16 to 17 and 18 to 21 year old age strata of the study were proportionately larger than those of the regional population. Thirty-four percent of the region's population had not reached 18 years of age, which is an age when wilderness participation is increasing. This suggests a potential increase in the number of hikers within the next ten years.

TABLE 2

AGE DISTRIBUTION OF RESPONDENTS COMPARED WITH THE COMBINED EAST SOUTH CENTRAL AND SOUTH ATLANTIC REGIONAL POPULATIONS

	Age Groups (Years)						
Item	16-17	18-21	22-35	36-50	51 +	Total	Mean
	Percent						
Respondents	7.0	15.0	43.0	28.0	7.0	100	26.3
Regional population	5.7	10.4	26.5	24.2	33.2	100	
No. of cases = 558							

SOURCE: U. S. Census, 1972.

Only 7 percent of the respondents sampled were in the 50-year old or older age class. This would seem to indicate declining participation with increasing age, but Lucas (1971a) attributes this more to a historical background of the user rather than one of a physical limitation factor. He states that older people grew up in different types of environment with longer work weeks, limited mobility, restrictive attitudes toward leisure, and less opportunities to participate in outdoor recreation. Consequently, we could expect them not to be interested in wilderness types of experiences.

Age distribution of oldest and youngest group members. The ages were obtained to indicate the variation of age within each hiking party. Tables 3 and 4 reveal these age classifications. In comparing these ages with the regional population, a larger number of respondents were represented for the 22 to 50-year groups for oldest members and 18 to 21-year groups for youngest group members of the study populations, respectively.

TABLE 3

AGE DISTRIBUTION OF OLDEST MEMBERS OF THE STUDY POPULATION COMPARED WITH THE COMBINED EAST SOUTH CENTRAL AND SOUTH ATLANTIC REGIONAL POPULATIONS

	Age Groups (Years						
	16-17	18-21	22-35	36-50	51-80	Total	
Item	Percent						Mean
Respondents	3.0	13.0	44.0	31.0	10.0	100	32.0
Regional population	5.7	10.4	26.5	24.2	33.2	100	
No. of cases = 558							

SOURCE: U. S. Census, 1972.

TABLE 4

AGE DISTRIBUTION OF YOUNGEST MEMBERS OF THE STUDY POPULATION COMPARED WITH THE COMBINED EAST SOUTH CENTRAL AND SOUTH ATLANTIC REGIONAL POPULATIONS

	Age Groups (Years)							
Item	0-4	5-9	10-13	14-17	18-21	22-35	Total	Mean
	Percent							
Respondents	6.2	13.4	12.0	12.4	24.7	31.3	100	22.2
Regional population	14.1	16.7	13.3	13.2	12.0	30.7	100	
No. of cases = 485								

SOURCE: U. S. Census, 1971.

Sex. Ninety-two percent of the hikers interviewed were males. The reason for this high percentage of males was due primarily to the interviewing procedure. In family relationships the family chose their own representative, usually the husband or father, for their spokesman. This was a condition of the study. Of the 558 respondents interviewed, approximately 64 percent were from family groups and 33 percent from peer groups.

Marital status and parenthood. Sixty-eight percent of the respondents were married, a figure consistent with the high number of dayhiker family groups interviewed on the trails. Of those respondents who were married, 45 percent had at least one child (Table 5). Fifty-five percent, however, had no children in their families.

TABLE 5

NUMBER OF CHILDREN IN RESPONDENTS' FAMILIES

	Number of Children							
	0	1	2	3	4	5	6	Total
Percentage	55	9	18	11	5	1	1	100
Number of Cases	308	48	98	62	29	8	5	558

Educational attainment. Of the respondents interviewed, 34 percent were students. This included some 30 percent of all respondents having a high school education or less, 29 percent with some college education, 30 percent college undergraduates, and 11 percent postgraduates. The education of respondents in this and some other studies are shown in Table 6.

Wilderness users have consistently been persons with high educational attainment compared with other outdoor recreation participants. These data and other studies indicate that people who have had at least some college education are more likely to be wilderness users than people who have only a high school education or less. Hendee (1968a), in studying western wilderness areas, indicated that persons with postgraduate educations are more likely to visit wilderness then people with lower educational attainments. This is true for some eastern wilderness areas and is adequately supported by this study with 11 percent of all respondents having postgraduate educations.

In comparison to the wilderness hiker, other user groups, such as those who actively engage in camping, hunting, and fishing, tend to

TABLE 6

COMPARISON OF EDUCATIONAL ATTAINMENT OF RESPONDENTS, NATIONAL POPULATION, AND FOREST RECREATIONISTS IN SEVERAL OTHER STUDIES

Item	Educational Attainment (Percent)			
	High School	College	Post-graduate Work	Total
GSMNP Respondents	30.0	59.0	11.0	100
A. T. Trail User, non-student (Murray, 1972)	20.1	43.7	36.2	100
Campground Users in Four Areas, TN (McCall, 1972)	62.0	34.0	4.0	100
N. F. Wilderness Users, Pacific NW (Hendee, 1967)	34.6	35.4	30.0	100
N. F. Campground Users, Pacific NW (Hendee, 1967)	51.7	29.7	18.6	100
U. S. Census, Persons 25 years and older (1972)	76.8	15.4	5.6	97.8*

*2.2 percent having no years completed in education.

have less education. Hendee (1969b) points out various research findings confirming this fact. In one instance he mentioned a recent study, 1968, in the Northeast, that showed only 27 percent of the fishermen and 22 percent of the hunters had higher than high school educations, but that 52 and 59 percent, respectively, were high school graduates.

In another study of National forest recreationists in the Pacific Northwest, Hendee (1967) revealed that 66 percent of the wilderness users had college educations and 30 percent had done postgraduate work, while only 29 percent of car campers had college educations and only 18 percent had done postgraduate studies. McCall (1972), in a study of four separate recreation areas in Tennessee, revealed approximately 62 percent of the campers interviewed had a high school education or less, while 34 percent had some college, and only 4 percent had done postgraduate work. It could be concluded that wilderness hikers tend to have college educations.

Occupation. As stated earlier, 34 percent of all respondents in the sample were high school and college students. The distribution of respondents by occupations are shown in Table 7. These occupations were classified on the basis of job descriptions shown in Table 24, Appendix F. Seventeen percent of the respondents were classified as professional or technical workers; 10 percent were managers, officials, or proprietors; and 18 percent were clerical and sales workers. Nineteen percent were classified as skilled and non-skilled wage earners, while only 2 percent were not employed. Since a person's occupational status is closely

TABLE 7

OCCUPATIONAL DISTRIBUTION OF RESPONDENTS

Occupation		Percentage
I.	Professional - technical	17
II.	Manager - official - proprietor	10
III.	Clerical - salesworker	18
IV.	Craftsmen - foremen	9
V.	Operatives - laborers	3
VI.	Service workers	2
VII.	Farm workers	*
VIII.	Housewives	5
IX.	Students	34
X.	Not employed	2
	Total	100

No. of Cases = 558

*Less than 1/2 of 1 percent.

correlated with his educational level and wilderness users typically are from the upper educational levels, these occupational stratifications were not unexpected.

Income. Students were included in the income distribution but were classified as such and not representative of the working class. Eight percent were high school students, 16 percent were single college students, and 9 percent were married college students. Married respondents attending college are probably more independent than the other students, but still are not representative of the working class. Table 8 shows a comparison of the annual incomes of respondents and of people in the southeastern region of the country. Thirty-three percent of the non-student respondents indicated that their combined household income was in excess of $15,000, but non-student respondents who earned less than $7,000 a year in combined household income represented only 4 percent of the sample population. Murray's (1972) data, which showed a 44 percent non-student population having incomes over $15,000, strengthens the proposition that hikers tend to be persons with higher incomes.

Lucas (1971a) discusses the point about lower income groups having lower participation rates in outdoor recreation activities. He states there is an income threshold beyond which certain people become potential wilderness users. According to Lucas, participation rates are fairly constant for incomes beyond this threshold. For example, a person must have a minimum disposable income just to afford to travel to a wilderness area.

TABLE 8

COMPARISON OF YEARLY INCOME OF RESPONDENTS AND SOUTH CENTRAL AND SOUTH ATLANTIC REGIONAL POPULATIONS

Item	Yearly Combined Income of Household					
	Less than $3,999	$4,000 -6,999	$7,000 -9,999	$10,000 -14,999	$15,000 +	Total
	Percent					
Respondents (non-students)	2.0	2.0	9.0	21.0	33.0	67.0
Regional population	21.0	20.9	20.7	22.2	15.2*	100.0
No. of cases = 558						

*Represents all incomes of $15,000 and above.

SOURCE: U. S. Census, 1972.

Supplementary Information

Childhood and present living environments. Respondents were asked to classify by population their present and past living environments (Table 9). Nineteen percent of the respondents indicated a rural upbringing (communities with less than 4,999 inhabitants), while 25 percent had urban residences as children (communities with 1000,000 to 499,999 inhabitants). This difference was partially due to the various age distributions of the respondents sampled. Older respondents tended to come from rural backgrounds, while young to middle-aged adults had urban residences as children. While there was an observable shift toward more respondents living in cities, this is not surprising since 70 percent of our population live in cities (U. S. Bureau of the Census, 1971). Other studies also substantiate that visitors to wilderness areas tend

to be urban-bred and are more likely to reside in urban areas (ORRRC, 1962b; Lucas, 1964b; Hendee, 1967, 1968a).

TABLE 9

COMPARISON OF CHILDHOOD AND PRESENT LIVING ENVIRONMENTS OF RESPONDENTS

	Population							
Item	Less than 4,999	5,000 -9,000	10,000 -24,999	25,000 -49,999	50,000 -99,999	100,000 -499,999	500,000+	Total
	Percent							
Childhood*	19	5	10	12	13	24	17	100
Present	8	4	9	12	12	32	23	100

No. of cases = 558

*Ages six through eighteen.

Residence at the time of sampling. The sampling of GSMNP trail respondents was conducted in two states, Tennessee and North Carolina. Transient users from approximately thirty states were represented in this survey. Their residences were classified according to their postal zip code to aid in pin-pointing their exact city of residence. The distribution of residents is shown in Table 10.

Eighty-two percent of the respondents were from three major regional areas: (1) Tennessee, Mississippi, Alabama, Georgia, and Florida made up 43 percent of the respondents; (2) Kentucky, Indiana, Ohio, and Michigan made up 26 percent of these respondents; and (3) 13 percent were represented from the District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Delaware, and Maryland.

TABLE 10

ZIP CODES AND STATE GROUPINGS USED FOR RESIDENCE DISTRIBUTION AND COMPUTER ANALYSIS

Zip Codes	States		
00000-09999	New Jersey	Connecticut	Main
	Rhode Island	New Hampshire	Vermont
	Massachusetts	Virgin Islands	Puerto Rico
10000-19999	New York	Pennsylvania	
20000-29999	District of Columbia	Maryland	Delaware
	North Carolina	West Virginia	Virginia
	South Carolina		
30000-39999	Tennessee	Mississippi	Alabama
	Georgia	Florida	
40000-49999	Kentucky	Indiana	Ohio
	Michigan		
50000-59999	Iowa	Wisconsin	Minnesota
	South Dakota	North Dakota	Montana
60000-69999	Missouri	Illinois	Kansas
	Nebraska		
70000-79999	Arkansas	Louisiana	Oklahoma
	Texas		
80000-89999	New Mexico	Colorado	Arizona
	Utah	Nevada	Wyoming
	Idaho		
90000-99999	California	Oregon	Washington
	Alaska	Hawaii	

B. The Hiking Trip

Hiking Experience and Awareness of Other Areas

Years spent hiking. Nineteen percent of the respondents classified themselves as non-hikers (Table 11). Thirty-four percent had been hiking from two to five years. Sixty-three percent of the respondents, usually dayhikers, had been hiking less than five years. This suggests that hiking is an increasing activity among these respondents.

Average number of days spent hiking annually. Sixty-one percent of the respondents averaged more than five days hiking per year (Table 12). Thirty-four percent spent more than ten days hiking, and 8 percent spent more than 30 days hiking.

TABLE 11

DISTRIBUTION OF RESPONDENTS BY NUMBER OF YEARS SPENT HIKING

Years Hiking	Percentage
Non-hiker	19
0-1	10
2-5	34
6-10	20
11-19	10
More than 20	7
No. of cases = 558 Total	100

TABLE 12

DISTRIBUTION OF RESPONDENTS BY DAYS HIKED PER YEAR

Average Number of Days Spent Hiking Per Year	Percentage of All Hiking
0 - 5	39
6 - 10	27
11 - 20	19
21 - 29	7
30 +	8
No. of cases = 558	Total 100

Backpacking trips. Respondents were asked what was the longest backpacking trip, in days, that they had ever taken. Fifty-two percent had never taken an overnight backpacking trip, while 47 percent had taken at least one such trip. Only 11 percent of the hikers had taken extended trips longer than seven days. Dayhikers who had backpacked indicated they had spent an average of 7.82 days as their longest extended backpacking trip.

Best source of information. As shown in Table 13, 57 percent of the sampled respondents indicated that the National Park Service was their best source of information about hiking in the GSMNP. Twenty percent learned about the Smokies from friends and other hiking acquaintances. About three-fifths of the hikers indicated the park as their best communication source. The National Park Service by using information and interpretive devices could relate management objectives

directly to these user groups and control various hiking clientele. Not only the Park Service, but all administering agencies should cooperate and coordinate their information and interpretive literature to all various user groups involved. McCall (1972) pointed out this fact in his study of campers. He stated that campers should be made aware of overused areas and be given appropriate literature telling them of lesser used areas and opportunities.

TABLE 13

DISTRIBUTION OF BEST SOURCES OF INFORMATION AS INDICATED BY RESPONDENTS

Item	Percent of Sample
Park itself	57
Friends and hikers	20
Appalachian Trail Conference and guide books	9
Federal publications	4
Chamber of Commerce and American Automobile Association	3
Experience	4
Carson Brewer trail guide	3
No. of cases = 558 Total	100

Awareness of other hiking areas. This question was asked in association with the determination of why respondents came to the Smokies to hike. Sixty-nine percent were aware of hiking opportunities other than those in the GSMNP. Areas mentioned most frequently were northern and southern state parks in the United States which accounted

for 44 percent and 41 percent, respectively, of the responses. Considering that 25 percent of the respondents indicated they were camped within the GSMNP, these figures can be expected. Eighteen percent mentioned other National parks in the East, and parks in the West were mentioned 20 percent of the time. National forest areas in the Northeast were cited 18 percent of the time, 11 percent mentioned Forest Service lands in the West, and 29 percent indicated that they were aware of hiking opportunities in Southern National Forests. In addition to these, private and other wilderness areas were mentioned 14 percent of the time. Awareness, however, did not mean participation, so users were asked about their hiking frequency in these other areas.

Hiking frequency in other areas. Approximately 90 percent of all respondents indicated that they hiked between 26 and 75 percent of their total hiking experience in the Smokies. Eighty-five percent of the respondents hiked less than ten times a year in other areas designated by them. Seventy-two percent hiked less than five times in these other areas. This suggested that respondents planned occasional major trips for hikes to areas other than the GSMNP. Hikers indicated that they made trips of this kind to the Rockies, or other National parks in the West. Some respondents said that they were visiting the GSMNP enroute to other recreation areas and to visit friends and relatives.

Catton (1969) describes the typical itinerary of the western National park visitor. It is shaped in an elongated oval or crescent including one or more parks enroute to or from the most remote area visited. He points up the fact that some people visit National parks

or similar areas combined with their intentions to visit relatives, urban centers, world's fairs, etc. The GSMNP has these kinds of visitors traveling through it each year. This park is highly accessible and a major scenic attraction for millions each year traveling in their "eastern flyway" north or south to visit relatives, friends, and other major attractions.

Percentage of hiking in these other areas. Thirty-eight percent of the respondents hiked less than 25 percent of their total hiking experience in other areas, while 44 percent hiked 76 to 100 percent of their total hiking in these other areas. This 38 percent includes many of the visitors that come back repeatedly to the GSMNP and conduct most of their hiking in this park when they visit.

Group size and types. Two principal group types were sampled. Sixty-four percent of the respondents were family type organizations, while 33 percent were peer or friend-relationship type users. The remaining 3 percent were organized groups such as Scout troops, Y.M.C.A., Y.W.C.A., horseback riders, and church organizations.

Nine percent of all respondents were solitary or lone hikers. The majority of hikers traveled in groups consisting of two to four members. The average group size for dayhikers was 3.14 members per party, while backpackers averaged consistently higher with 3.82 members per party. Eighty-two percent of all groups had two to five members per party.

Company and season preference. Respondents were asked their preferred hiking company and season. It was found that families preferred to hike as a family and peer groups preferred to hike with other peers and associates. (Statistically significant at the 0.05 level Chi-square analysis, see Table 14.)

TABLE 14

RESPONDENTS' PREFERRED HIKING COMPANY

Preference	Percent
Alone	7
One Companion	8
Peer Group	27
Family	57
Scout Group	*
Hiking Club	*
No. of Cases = 558	

*Less than 1/2 of 1 percent.

Family dayhiking groups preferred hiking during the summer season and were found to be significant at the 0.05 level (Table 15). Forty-one percent of all respondents preferred the summer season, 24 percent indicated the fall of the year as their favorite hiking season, 11 percent preferred the spring season, and only 1 percent preferred the winter season. Twenty-three percent of all hikers, generally backpackers, preferred all seasons of the year and had no specific preference.

TABLE 15

RESPONDENTS' PREFERRED HIKING SEASON

Preference	Percent
Spring	11
Summer	41
Winter	1
Fall	24
All Seasons	23
No. of Cases = 558	

Length of stay and activities. Seventy-four percent of the respondents were dayhikers. Twenty-six percent of the respondents were backpackers which stayed an average of 4.53 days. The length of stay for backpackers was computed for their responses based on total length of trip into wilderness areas. Backpackers could have been traveling through the GSMNP and going to other such areas, but the majority stayed within the boundary of the park. Only 6 percent of all backpacking respondents were staying over six days in the backcountry.

Thirty-nine percent of all hikers included photography as an activity during their hike. As stated earlier, 25 percent were staying in a GSMNP campground. Approximately 40 percent of these respondents were campers staying at Cades Cove, hiking to Abrams Falls. Four percent of the overnight hikers were staying at Mount Le Conte Lodge. There was a significant relationship between length of stay and the route taken by backpackers (at the 0.05 level using Chi-square analysis). These overnight hikers' length of stay was found significantly shorter

on the rationed shelter trails and routes than other trails that were sampled in the GSMNP (at the 0.05 level--Chi-square analysis). This was a result of the restrictions imposed by the Park Service regarding length of stay at certain shelters. Shorter trips, especially on the Appalachian Trail, were observed on these rationed trails in comparison to longer length's of stay on the non-rationed trails. Hikers probably prefer the Appalachian Trail because of its well-known attributes and that they also enjoy hiking to the top of ridges and scenic vistas.

Indicators of Traffic Patterns and User Intensity

Route taken. Seventy-three various routes were classified into twelve various areas or zones of usage. This procedure was used to determine various impacts in certain sectors of the park. Hikers generally planned specific routes to their destinations. These were classified and coded It is recognized that some hikers probably changed their routes. This was probably more true for the dayhiker than the backpackers. The overnight shelter user was programmed to travel a particular route because of permit regulations forcing him to stay at a designated campsite. There were 95 trail campsites in addition to the 23 shelters available for the overnight user within the GSMNP.

User rate intensities. Interviewing locations were distributed over the area in such a way so as to gain an indication of hiking intensity in various parts of the park. Also, these locations were chosen to observe how use varied within the park and to get a better conception of route patterns.

The number of hikers in each group were tabulated along with hikers passing by and missed while interviewing. Three-hour sampling periods gave some indication of an hourly rate and some measure of absolute use of the hiking traffic on these various trails. The total number of hikers passing these trail sampling locations were determined for each sampling period and were indicated as three-hour rates of use. (See Appendix F, Table 25.)

Trails that showed evidence of vegetation damage, compaction, or overuse seemed to be trails that were highly accessible by Highway 441. Also, the Appalachian Trail shows impact from the many hikers that have used it in the past without restrictions coupled with the lack of proper maintenance to withstand user pressure. The parking areas at Newfound Gap and Alum Cave Bluffs were significant incentives for the dayhiker to stop and hike, but was also an influence for starting points used by backpackers. Transportation was a major concern for backpackers and these parking areas were thought to be reasonably safe.

The National Park Service is aware of the accessibility problem posed by Highway 441; the very accessible areas of Laurel Falls, the Chimneys, and Clingmans Dome are prime examples of trails that had to be reinforced with rock or asphalt because of overuse.

Many factors influence the intensity of use and until more can be learned managers will not be able to cope with trail compaction, littering of trails, vegetative or "trophy" removal, and overall satisfactions and benefits to the user's experience. The mandatory wilderness permit restricted backpackers to certain trails and campsite locations. It would have been interesting to compare rates of use without these

restrictions to the present study when they were in effect.

Attitudes toward transportation through the park. Respondents were asked whether they thought Highway 441 should be closed to all vehicles through the Smokies provided some means of public transportation was furnished within the park. Sixty-two percent said they would not favor this proposal, while 38 percent agreed to it. A significant difference was observed between dayhikers and backpackers regarding this question. Seventy percent of the backpackers agreed to close Highway 441, while only 30 percent of the dayhikers agreed to close this road (significant at the 0.05 level Chi-square analysis). Dayhikers were generally opposed to the closing of this trans-mountain road for various reasons. Their major reason was that they preferred their own private vehicle for sightseeing instead of a mass transit vehicle. Backpackers, on the other hand, were in agreement to the closing of this highway. This was probably a partial solution to their transportation problem within the park. Students and other users were also quite concerned with the pollution and environmental problems automobiles caused within the park. If this highway were closed, trail access for hikers might be dispersed and thereby, trail usage would be more evenly distributed.

C. Motivations and Perceptions of the User

Choice of the Resource Area

In response to the question about why users hiked in the GSMNP rather than other areas, for example, National forests, state parks, and other hiking areas, their reasons were as numerous as the different

types of hikers represented. These responses were classified by 17 different categories (see Table 23 in Appendix E). Each hiker probably had a different motivation for coming to the Smokies, but certain similar responses were grouped and categorized according to these similarities. Fifteen percent of the hikers indicated a "love" for the mountains and cited certain inherent characteristics of the GSMNP. Twenty percent of the respondents indicated that they hiked in the GSNNP primarily because of accessibility. Dayhikers were found significantly different from backpackers in their reasons for hiking in the Smokies (at the 0.05 level of significance--Chi-square analysis). This difference was due to dayhikers citing accessibility with more frequency than backpackers. Sixteen percent had never been to the GSMNP and wanted to visit. This may have been a status-motive preference, although this response was not specifically evaluated. Eight percent stated they had been there at least once before and wanted to return. Reasons for returning were also varied, but the primary purpose of their visits was to see more attractions within the park or hike other trails than they had on previous trips.

Attitudes About Activities On Trails

Horses. Sixty percent of the hikers sampled indicated they had definite objections to horses using hiking trails. Backpackers were found to be less tolerant than dayhikers regarding horses using hiking trails (at the 0.05 level of significance). Horses often leave trails badly muddied; backpackers often need to move off the trails to prevent startling horses, and fecal matter on the trails made hiking unpleasant.

These were a few of the complaints levied against horses by hikers.

Horseback riding groups interviewed (less than 1/2 of 1 percent) expressed a different view. While they did not mind hikers, they seemed irritated because of unwarranted complaints leveled against horses. According to horse groups, maintenance was needed for hiker impact as well as for horse impact; not all the blame should be placed on the riding groups.

Fifty-one percent of the hikers preferred separate trails. Many hikers on the Gregory Ridge trail mentioned overuse and damage caused by horses on Gregory Bald. This should be looked into more fully and analyzed to determine the specific problems involved.

Hikers. Forty-six percent of all hikers said they could encounter as many as 30 or more other hikers a day on any given trail before they felt any overuse or any decrease in their hiking satisfactions. This attitude reveals one of the sociological or psychological aspects of trail carrying capacity. Backpackers, on the average, were more intolerant towards meeting larger groups than dayhikers (significant at the 0.05 level).

The quality of trails and hiking experiences will decrease as levels of use increase. Considerations must be given to limiting total use or to distributing use over time and space; for example, re-routing of hikers and limitations of daily or periodic use. This is essentially what the National Park Service is trying to accomplish with the mandatory backcountry permit. Some decrease in satisfaction, however, may be

acceptable. We may have to accept the trade off between decreasing an individual's satisfaction and the increasing number of total participants.

Held et al. (1967) resolved that recreation or visitor carrying capacity cannot be considered as a single, absolute value; rather they concluded that:

> . . . the major consideration in determining the level of use of an area is the trade-off between the benefits which result from admitting additional users to the area or permitting more intensive use of the area and the losses, if any, associated with the increase of intensification of use.

Stankey (1972c) relates this problem to social and physical interactions, not just an ecological determinant. Figure 3 presents one conceptual framework for a study of carrying capacity and how complex these interactions can be. He points out that carrying capacities do not form linear relationships, and that method of travel and party size both appear to be more critical aspects of use than just simple numbers of hikers. Intensity of use, character of encounters, spatial-temporal aspects of use, and destructive visitor behavior all are factors that must be analyzed to determine their effects upon the user.

D. Attitudes Toward Managerial Inputs

Signing and Trail Marking

Trails within the GSMNP are marked by wooden signs at trail heads and major junctions giving distance and shelter locations, and other pertinent information. Notification of regulations concerning certain shelter facilities were usually posted on a special bulletin board. The Appalachian Trail is marked by a six-inch long, two-inch wide white paint blaze.

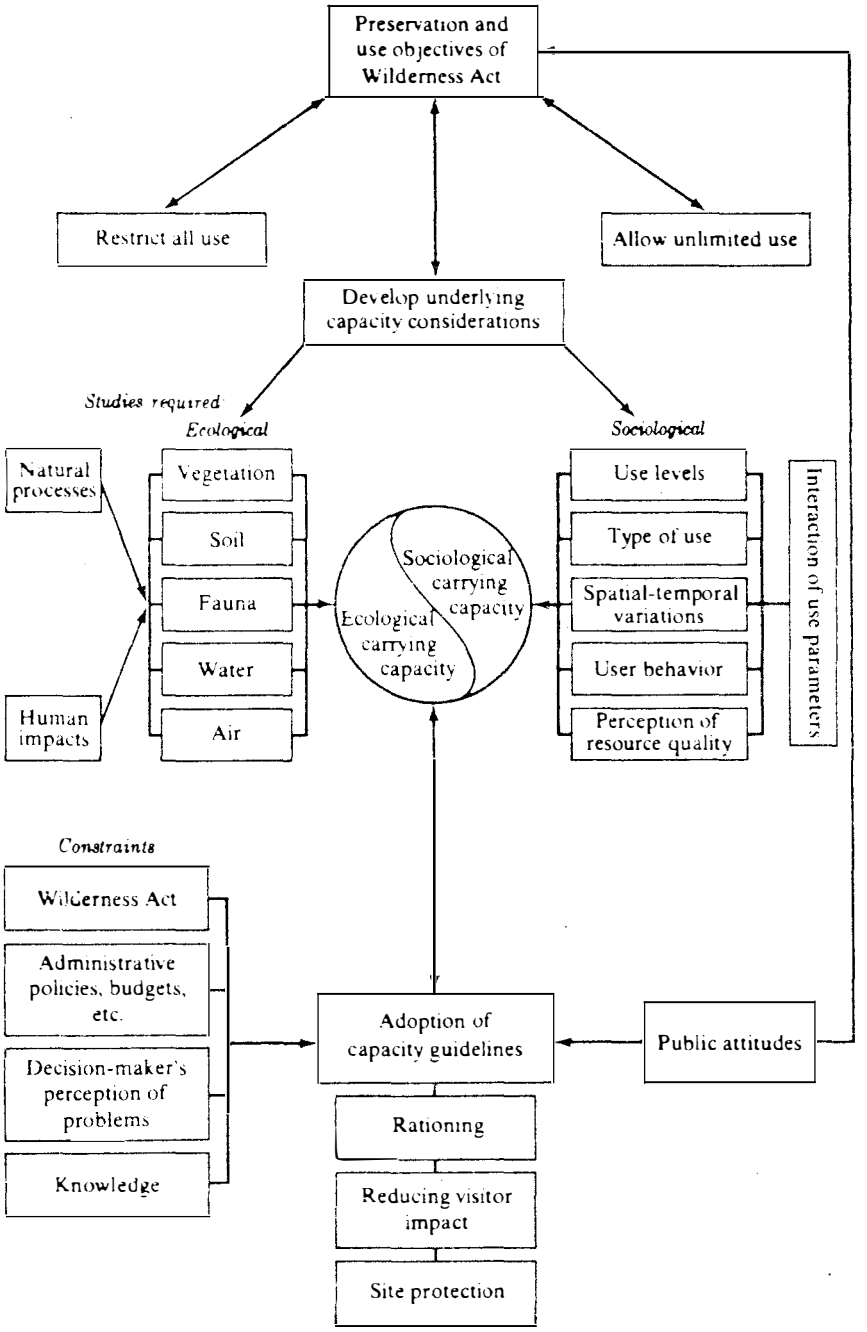


Figure 3. A conceptual framework for the study of carrying capacity.

SOURCE: George H. Stankey, Natural Environments--Studies in Theoretical and Applied Analysis (Baltimore: Published for Resources for the Future, Inc., by The Johns Hopkins University Press, 1972), pp. 88-114.

While 62 percenf of all hikers stated they would like additional information posted at entrance points (steepness of trail, difficulty ratings, or time estimates), over 60 percent of all backpackers opposed this idea. For backpacker's, maps, the Appalachian Trail guide book, and other sources for trail use were sufficient for their hiking purposes.

Trail and Shelter Conditions

Hikers were asked for their comments about trail conditions they observed and experienced on their hiking route. Over 80 percent responded and perceived the trails to be in good condition. Dayhikers felt that trails were well-maintained and gave them an adequate trail experience. While certain trails were obviously rutted, muddy, or littered, day-hikers for the most part accepted these "little discomforts" as part of the hiking experience. Although this was not true for all respondents a large proportion of hikers spoke favorably about trail construction and design. The more experienced hiker or backpacker usually recognized damage from overuse of trails and were understanding in limiting overuse of these trails; they consequently seemed to understand the limitations placed on trail use. While hikers' attitudes were favorable regarding maintenance, a lack of maintenance was clearly observed on various trails which indicated demands for improvement.

Trail crews cutting grass along some trails were observed by the author, but no action was being taken to divert water off the trails in key locations. This problem is especially indigenous to the Appalachian trail where large water pools have collected in the trail, hikers have moved around these muddy spots hence widening the trail even further.

Drainage bars are definitely needed in some of these areas to prevent further widening of the trail and on steeper slopes to eliminate erosion.

Twenty-six percent of all respondents indicated that they had stayed in overnight shelters and 73 percent of these people preferred shelter facilities to tents or tarps. Shelter capacity in the GSMNP ranged from six to fourteen available bunks per shelter. Users were asked their opinion as the optimum number of persons shelters should accommodate. Sixty-six percent of the shelter users indicated that they wanted no more people than the shelter was designed to accommodate (Table 16). Thirty percent of the backpackers wanted no more than ten persons per shelter.

TABLE 16

SHELTER CAPACITY PREFERENCE OF SHELTER USERS

QUESTION: In your opinion, what is the optimum number of persons a shelter should accommodate?

Optimum Capacity	Percent
0 - 6	20
7 - 10	10
11 - 14	0
15 - 19	2
20 +	2
Capacity of the shelter	66
TOTAL	100

No. of Cases = 148

Shelter conditions seemed adequate for 55 percent of the respondents who stayed overnight in them. Sixteen percent of those who stayed in shelters indicated they needed some type of maintenance to various shelter facilities, while 12 percent of the ones who stayed in shelters were displeased with the littered conditions of the shelters or areas surrounding the facilities.

Trail Rationing and Permit Restrictions

Effective June 5, 1972, certain shelters (and consequently trail use to these shelters) were rationed since a mandatory backcountry camping permit was required to stay overnight at any designated campsite in the wilderness (see Appendix D). This directive plus other pertinent information was posted at all trail heads and given out when permits were acquired. The permits were applicable only for certain shelters initially; eventually all shelters on the Appalachian Trail will be placed under these rationing procedures. Permits could be obtained at any ranger station, visitor center, or park headquarters no more than 24 hours in advance of departure on the trail--provided space was available. All hikes planned outside of rationed areas could receive a permit by mail. Ninety-five other alternative designated trail campsites were suggested for users if shelter capacities were full, or trails were being overused. These restrictions were well-publicized by news media, park personnel, and communication with various user groups, such as Scouts and other local interest groups. Only a few backpackers in this study who had planned major trips complained after they had already arrived in the park and discovered that restrictions were in effect.

Restrictions seemed somewhat useful in limiting overnight use of shelter facilities. While these restrictions of shelter facilities and trails were in effect, users were asked about how they felt about them. Forty-seven percent of the hikers agreed that some form of restrictions for trails and shelters were necessary (Table 17).

TABLE 17

OPINIONS OF RESPONDENTS ABOUT TRAIL AND SHELTER USE RESTRICTIONS

QUESTION: Do you think the use of some trails and/or shelters within the Smokies should be restricted as to use?

Response	Percent
Strongly agree	27
Agree	20
Neutral	14
Disagree	15
Strongly disagree	24
TOTAL	100

No. of Cases = 558

Thirty-nine percent of the respondents disagreed. Most of this disagreement was from dayhikers who opposed any limit of hikers on specific trails. Also, 14 percent were not knowledgeable enough about the regulations or had not formulated a definite opinion. The responses to this question during pre-testing for the questionnaire were somewhat different from the main study period. It was during this period that the National Park Service was planning to initiate some form of

limitation of overnight shelter use along the Appalachian Trail; thus the restrictions had not in fact gone into effect. These respondents in the pre-testing period (primarily Appalachian Trail users) were overwhelmingly in favor of restrictions during this period. This response was probably due to some extent to the fact that the regulations were not yet in effect, it was something in the future.

Respondents were also asked what kind of restriction would seem most equitable for them. Forty-six percent agreed with the permit system of control, 24 percent indicated they would restrict numbers of people in some way, and 10 percent wanted a system using a first come, first serve basis. Ninety-five percent indicated they would not object to being re-routed if trail conditions were critical or use was too high for any particular trail. While they did not mind being re-routed, comments were made to the effect that hikers still wanted to be able to reach their objective or destination. Forty percent commented that they had a particular destination in mind and 28 percent commented they wanted the distance to be equal for the re-routed trail. Thirty-two percent of the hikers commented they would prefer knowing conditions and to be re-routed another way. Of the 5 percent of the total that objected to being re-routed, 82 percent or four out of five, said they would go to another trail within the park.

E. Implications for Management

The findings of this study reveal certain aspects of hiking use and the user in the GSMNP. The findings have certain implications for the management of this particular resource area. The GSMNP is a unique

National park and must be considered as such in developing management guidelines affecting the resource, the user of this resource, and the hiking opportunities in surrounding areas. With respect to the latter, both the spatial and temporal relationship must be considered.

The population of this study was made up primarily of two user groups, dayhikers and backpackers. These two groups had similar and different opinions about motivations for hiking, experience in hiking, and attitudes toward certain managerial controls. Any management program should evaluate these characteristics and all users, and ultimately non-users, of the area in order to achieve optimum use of certain areas and trails.

Accessibility of certain areas and trails seemed to be a major cause of overuse within the park and could be a priority consideration for management of the area. The closing of Highway 441 could be one of the more practical alternatives in eliminating overuse and traffic control problems. However, if this is done, informational and educational programs should be used in conjunction with it to aid the user and inform him about underused or overused areas within the park and in various other recreation areas or ownerships proximate to the park.

Better trail planning, including design and re-design, of certain trails could also eliminate overuse and maintenance problems of certain trails. Instead of planning trails by the easiest or shortest routes, trails should be routed and constructed to withstand increasing user pressure and minimize maintenance. Reinforcement of some trails, even to the extent of paving, may be necessary to withstand certain impacts. Trails exclusively designed for dayhikers could be reinforced and

maintained to a high degree for these types of hikers who seek trails leading to specific scenic attractions within the area. Overnight users would tend not to use these trails and even avoid them. The reinforcing of these trails could increase their use but would have less damaging effects upon the resource.

Various other trails that are not specifically reinforced should be maintained at a higher level. With proper maintenance carrying capacities of certain trails could be increased, thus optimizing the benefits for the user and his hiking experiences. Proper drainage systems, bridge construction, improved switchback designs and grades, and separate trails for horses and hikers are some measures that could be used to increase the capacity of trail systems. Elimination of structures, for instance shelter facilities in the GSMNP, could also be an effective measure to reduce use, littered conditions around the site, and various enforcement problems of overcrowdedness and safety conditions.

A high percentage, 34 percent, of the respondents was made up of high school and college students. This group of hikers should be considered in determining effective programs to educate or influence them. Also, a high percentage of family dayhiker groups were represented in this study. Reaching all users may not be the most practical method, but by dissemination of information to special organizations and groups, for example these students and dayhikers, certain user groups could be effectively influenced.

In addition to these programs, continued research is needed in determining the psychological and sociological motivations of hikers, their attitudes towards hiking in the GSMNP and other areas of the

region, and methods to educate the users. These in-depth studies coupled with other continuous input data studies could aid the resource manager in optimizing benefits for the user and protecting the resource over time.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purpose of this study was to analyze trail use in the Great Smoky Mountains National Park and provide information for decision-makers to manage the wilderness resource for optimum benefits. This included gathering information to determine hikers' motivations for hiking, socio-economic characteristics of these hikers, and their attitudes toward trail use and management.

A. Summary

Characteristics of hikers were found to be not too different than those reported in other studies of wilderness areas. Hikers were found to be young to middle-aged adults, in that, 86 percent of all respondents were between the ages of 18 and 50 years old. Trail users tended to travel in small groups consisting of three to four members per party. Backpackers stayed an average of four and one-half days and generally were from urban (population of 100,000 or more inhabitants) environments. Older family groups, especially dayhikers over 50 years of age, usually had rural (population of 5,000 inhabitants or less) childhood living environments. Regarding education, at least 70 percent of all respondents had some college education; however, 34 percent of the total sample was comprised of students. Occupational stratifications such as: professional-technical (17 percent); managerial-official (10 percent); and clerical-sales personnel (18 percent) were somewhat equally represented

among these groupings. Thirty-three percent of all hikers interviewed, excluding students, had combined family incomes exceeding $15,000 per year.

Forty-seven percent of all respondents were in agreement about the need for some form of limitation on the number of hikers using trail and shelter facilities within the GSMNP. Generally, backpackers were more in favor of limiting use than dayhikers. Backpackers objected with more frequency to horses using hiking trails and encountering large numbers of other hikers than did dayhikers.

Motivations for hiking in the GSMNP rather than in other areas consisted of certain status motive preferences, accessibility of the park, and uniqueness of the area. Overuse of certain trails within the park seemed to be directly related with these factors. If overuse continues within the GSMNP, studying these motivations and socio-economic characteristics of the user may be necessary in order to initiate programs to encourage the visitor to use areas of lesser impact. Incentive type programs could be developed through the communication media to promote use in other areas. If these programs do not remedy the situation then direct regulatory action must be imposed to protect the resource area and to maintain maximum benefits for the experiences of all users.

The advantage of observing the user situation with no limitations on use was not available in this study since such limitations had been implemented concurrently with the study period. During the study period an overnight permit was required within the GSMNP to control usage of certain backcountry shelter facilities. On the other hand, there was the opportunity to observe initial reactions to limitations on use. This

decision to limit use, whether temporarily or permanently, needs to be considered in its relationship to other hiking areas and opportunities.

B. Conclusions

If use is to be limited, the methods by which it will be done become very important. Measures to disperse use or to restrict it are one way to accomplish this problem. Many alternatives which have been based on prior research should be examined when considering different management alternatives to regulate use. Some examples of these alternatives are as follows:

1. Site design and management--barriers, paths, one-way trails, elimination of certain structures, rotation of sites, closure of some areas or roads, artificial surfaces, irrigation, fertilization, and the use of subtle barriers of hardy vegetative species.
2. Modification of visitor behavior--communication, education, and interpretive programs, provision for users for greater choices in other hiking areas, encouragement of off-season use, and improved communication with information centers in urban areas proximate to the resource area.
3. Regulate visitor behavior by direct means--wilderness permits, party-size limitations, rationing, lotteries, reservation systems, certification or eligibility requirements, limiting access, zoning, and pricing.

Some of these alternatives have already been implemented in some areas although they may not be recognized as such. Of course, all these

alternatives must be considered in relationship to other recreational and hiking areas in order to redistribute use properly. Redistribution, both in a spatial and temporal sense, can be one of the most effective methods of reducing use of certain trails, facilities, or areas. The GSMNP has tried to accomplish redistribution through limitations on overnight use of shelter facilities within the park. By direct regulation and enforcement of the backcountry permit regulations use has been redistributed to other lesser-used trails within the park. However, problems continue to exist such as littering of shelter facilities, overuse due to accessibility within the park, and critical trail conditions due to compaction and lack of maintenance within the park.

Site design and development in a particular area can be an effective measure to restrict use and impact upon a certain trail, facility, or area. Removal of some overnight shelters, rotation of certain sites, or the closure of some overused areas could be some ways to eliminate overcrowding, littered conditions, and compaction of various cites. Parking areas should be redesigned or eliminated in certain circumstances. Ideally, these could be parking areas for mass transit systems and serve as interpretive entrances to various areas. Mass transit systems could relieve the traffic problems which currently exist within the GSMNP. Also, hikers could be redistributed throughout the park and provide a remedy for the backpacker's transportation problem; i.e., he would not have to be concerned with the safety of his vehicle. Also, hikers could travel different routes, debark, and be picked up at various points within the area.

Modification of visitor behavior can also be effective in redistributing use. Various advantages of off-season use such as: "solitude," local, seasonal attractions, or other characteristics unique to the area should be emphasized through educational and informational programs to the user. Educational and interpretive literature should be used to disseminate vital information of both overused and lesser-used areas to the user to allow a greater choice in planning his activities. Before further limitation is required these alternatives should be considered and perhaps incorporated and used in conjunction with decisions in rationing use.

Regulating visitor behavior by direct controls is sometimes the only way to redistribute use. To a certain extent some of these methods are already being conducted within the GSMNP. Wilderness permits for overnight shelter facilities have limited the numbers of backcountry users at these shelter sites. This is one form of a reservation system. Also, hikers planning trips outside the rationed areas can get a permit by mail rather than applying in person at the park. This is another variation of a reservation system. Eligibility requirements are initiated, in that Scouts using the GSMNP are required to demonstrate certain skills, have a degree of physical stamina, and have an appreciation for the resource before they participate in their various activities within the park. As the level of affluence increases among wilderness users, as well as among other recreationists, pricing should be considered as another means to redistribute use. Land use planning and regional zoning are also the most basic and valuable of alternatives in ensuring opportunities and non-conflicting uses of large recreational areas. Proper

planning and resource allocation are necessary to meet the needs of urban, rural, and lower income as well as higher income populations. Opportunities for trail and natural environment activities near the central city, if not within, could aid in providing substitutes for wilderness use for some people. Wilderness areas need to be evaluated and planned with these factors in mind; where the user lives, his motivations for visiting certain areas, and the opportunities he desires.

Lastly, carrying capacities for the particular resource area will have to be determined through constant research, including evaluation of the user's experiences, and knowledge about distribution patterns of visitor activity. But perhaps more important to decision-makers concerning use regulations are the considerations which must be given to coordination among agencies and organizations within regions about aggregate recreation user benefits.

REFERENCES

REFERENCES

Beardsley, Wendall, G., and J. Alan Wagar. 1971. Vegetation management on a forested recreation site. Journal of Forestry, 69(1):728-731.

Brewer, Carson. 1962. Hiking in the Great Smokies. Knoxville, Tenn.: Holston Printing Co. 66 pp.

Brockman, C. Frank. 1969. Recreational Use of Wild Lands. New York: McGraw-Hill. 346 pp.

Brown, Perry J., and John D. Hunt. 1969. The influence of information signs on visitor distribution and use. Journal of Leisure Research, 1(1):79-83.

Burch, William R., Jr. 1966. Wilderness - the life cycle and forest recreational choice. Journal of Forestry, 64(9):606-610.

_____, and Wiley D. Wenger, Jr. 1967. The social characteristics of participants in three styles of family camping. USDA Forest Service Research Paper PNW-48. 29 pp.

Burke, Hubert D. 1969. Wilderness engenders new management traditions. Living Wilderness, 33(106):9-13.

Cain, S. A. 1931. Ecological studies of the vegetation of the Great Smoky Mountains of North Carolina and Tennessee. I. Soil reaction and plant distribution. Botanical Gazette, 91:22-41.

_____. 1935. Ecological studies of the vegetation of the Great Smoky Mountains. American Midl. Nat., 16:566-584.

Campbell, Frederick L., John C. Hendee, and Roger Clark. 1968. Law and order in public parks. Parks and Recreation, 3(12):28-31, 51-55.

Catton, William R., Jr., and John C. Hendee. 1968. Wilderness users, what do they think? American Forests, 74(9):28-31, 60, 61.

Catton, William R., Jr. 1969. Motivations of wilderness users. Pulp and Paper Magazine of Canada, December, pp. 121-126.

Champion, Dean J. 1970. Basic Statistics for Social Research. Scranton, Pennsylvania: Chandler. 310 pp.

Clark, Roger N., John C. Hendee, and Frederick L. Campbell. 1971. Values, behavior, and conflict in modern camping culture. Journal of Leisure Research, 3(3):143-159.

Clawson, Marion, and Jack L. Knetsch. 1966. Economics of Outdoor Recreation. Baltimore: Johns Hopkins. 328 pp.

Dana, Samuel T. 1956. Forest and Range Policy - Its Development in the United States. New York: McGraw-Hill. 455 pp.

Department of the Interior. 1967. Outdoor Recreation Space Standards. Washington, D. C.: Government Printing Office. 67 pp.

Festinger, Leon, and Daniel Katz. 1953. Research Methods in the Behavioral Sciences. New York: Dryden Press. 660 pp.

Fry, C. Luther. 1934. The Technique of Social Investigation. New York: Harper Brothers. 315 pp.

Fisher, Ronald M. 1972. The Appalachian Trail. Washington, D. C.: The National Geographic Society. 199 pp.

Frissell, Sidney S., Jr., and Donald P. Duncan. 1965. Campsite preference and deterioration. Journal of Forestry, 63(4):258.

Hammon, Gordon A., and John K. McDonald. 1967. Recreation information management. Trends in Parks and Recreation, 4(2):29-32.

Harry, Joseph, Richard Gale, and John C. Hendee. 1969. Conservation: an upper-middle class social movement. Journal of Leisure Research, 1(3):246-254.

Heinselman, M. L. 1965. Vegetation management in wilderness areas and primitive parks. Journal of Forestry, 63(6):440-445.

_____. 1966. Vegetation in wilderness areas. Trends in Parks and Recreation, 3(1):23-27.

Held, R. Burnell, Stanley Brickler, and Arthur T. Wilcox. 1969. A study to develop practical techniques for determining the carrying capacity of natural areas in the National Park System. Report to the National Park Service, Washington, D. C., November 15, 1969.

Hendee, John C. 1967. Recreation clientele--the attributes of recreationists preferring different management agencies, car campgrounds or wilderness in the Pacific Northwest. Diss. Abstr. 28(5):1747-B. University of Washington, Seattle. 2 pp.

_____, William R. Catton, Jr., Larry D. Marlow, and C. Frank Brockman. 1968a. Wilderness users in the Pacific Northwest--their characteristics, values, and management preferences. USDA Forest Service Research Paper PNW-61. 92 pp.

_____, and Archie Mills. 1968b. Enchantment wilderness: management to preserve wilderness values. Living Wilderness, Spring(101): 14-20.

_____, and Frederick L. Campbell. 1969a. Social aspects of outdoor recreation--the developed campground. Trends in Parks and Recreation, October, pp. 13-16.

_____, Richard P. Gale, and Joseph Harry. 1969b. Conservation, politics, and democracy. Journal of Soil and Water Conservation, 24(6):212-215.

_____. 1969c. Rural-urban differences reflected in outdoor recreation participation. Journal of Leisure Research, 1(4):333-341.

_____. 1969d. Appreciative versus consumptive uses of wildlife refuges: studies of who gets what and trends in use. Transactions of 34th North American Wildlife and Natural Resources Conference, March 2 - 5, Washington, D. C., pp. 252-263.

_____, and Robert W. Harris. 1970a. Foresters' perception of wilderness user attitudes and preferences. Journal of Forestry, 68(12): 759-763.

_____. 1970b. Recreational values, use, and management of natural areas. Proceeding of Natural areas--needs and opportunities. Symposium of 43rd annual meeting of Northwest Scientific Association, Salem, Oregon, pp. 35-38.

_____, Richard P. Gale, and William R. Catton, Jr. 1971a. A typology of outdoor recreation activity preferences. Journal of Environmental Education, 3(1):28-34.

_____, and Richard L. Bury. 1971b. Does recreational development pay off? Western Conservation Journal, 28(1):28-30.

_____, and Robert C. Lucas. 1973. Mandatory wilderness permits: a necessary management tool. Journal of Forestry, 71(4):206-209.

Holmes, Lester L., (ed.). 1971. Guide to the Appalachian Trail in Tennessee and North Carolina, Cherokee, Pisgah, and Great Smokies. Publication number 24 (third edition), The Appalachian Trail Conference, Inc., Washington, D. C. 352 pp.

Hughes, Jay M. 1965. Wilderness land allocation in a multiple use forest management framework in the Pacific Northwest. USDA Forest Service Research Note PNW-26. 4 pp.

James, George A., and Robert K. Henley. 1968. Sampling procedures for estimating mass and despersed types of recreation use on large areas. USDA Research Paper SE-31. 15 pp.

_____, and Hans T. Schreuder. 1971. Estimating recreation on the San Gorgonio Wilderness. Journal of Forestry, 69(8):490-493.

_____. 1967. Recreation use estimation on Forest Service lands in the United States. USDA Forest Service Research Paper SE-79. 8 pp.

Johnson, Warren A. 1967. Over-use of the National Parks. National Parks Magazine, 41(241):4-7.

King, P. B., R. B. Neuman, and J. B. Hadley. 1969. Geology of the Great Smoky Mountains National Park, Tennessee and North Carolina. Geological Survey Professional Paper 587. Washington, D. C.: Government Printing Office. 23 pp.

LaPage, Wilbur F. 1969a. The camper views the interview. Journal of Leisure Research, 1(2):181-186.

_____. 1969b. Campground marketing: the heavy-half strategy. USDA Forest Service Research Note NE-93. 6 pp.

_____. 1969. Wilderness-like recreation opportunities adjacent to the Boundary Waters Canoe Area. Naturalist, 20(1):36-39.

Lime, David W., and George H. Stankey. 1971. Carrying capacity: maintaining outdoor recreation quality. In Recreation Symposium Proceedings. USDA Forest Service, Northeastern Forest Experiment Station, Upper Darby, Pa., pp. 174-185.

_____. 1972. Large groups in the Boundary Waters Canoe Area--their numbers, characteristics, and impact. USDA Forest Service Research Note NC-142. 4 pp.

Lucas, Robert C. 1963. Bias in estimating recreationists' length of stay from sample interviews. Journal of Forestry, 61(12):912-914.

_____. 1964a. Wilderness perception and use: the example of the Boundary Waters Canoe Area. Natural Resources Journal, 3(3):394-411.

_____. 1964b. Recreational use of the Quetico-Superior Area. USDA Forest Service Research Paper LS-8. 52 pp.

_____. 1964c. The recreational capacity of the Quetico-Superior Area. USDA Forest Service Research Paper LS-15. 34 pp.

_____, and Dennis L. Schweitzer. 1965a. Outdoor recreation. USDA Forest Service Research Note LS-68. 2 pp.

_____. 1965b. A new research program for the Boundary Waters Canoe Area. Naturalist, 16(4):8-15.

_____. 1966. The contribution of environmental research to wilderness policy decisions. The Journal of Social Issues, 22(4):116-126.

_____. 1970. User evaluation of campgrounds on two Michigan National Forests. USDA Forest Service Research Paper NC-44. 15 pp.

_____. 1971a. Hikers and other trail users. In Recreation Symposium Proceedings, USDA Forest Service, Northeastern Forest Experiment Station, pp. 113-122.

_____, Hans T. Schreuder, and George A. James. 1971b. Wilderness use estimation: a pilot test of sampling procedures on Mission Mountains Primitive Area in Montana. USDA Forest Service Research Paper INT-109. 44 pp.

_____. 1971c. The challenge and the response . . . to Forest Service wilderness management in the Rockies. Naturalist, 22(3):2-5.

_____, and Jerry L. Oltman. 1971d. Survey sampling wilderness visitors. Journal of Leisure Research, 3(1):28-43.

McCall, Tim W. 1972. Characteristics of campers in forest recreation areas in East Tennessee. Unpublished Master's thesis, The University of Tennessee, Knoxville. 85 pp.

Merriam, Lawrence C., Jr., and Robert B. Ammons. 1967. The Wilderness User in Three Montana Areas. St. Paul: School of Forestry, University of Minnesota. 54 pp.

Murray, Judith Buckley. 1972. The Appalachian trail users in the southern national forests--their characteristics, attitudes, and management preferences. Unpublished Master's thesis. The University of Tennessee, Knoxville. 131 pp.

National Park Service. 1969. Resource management plan for the Great Smoky Mountains National Park. Gatlinburg, Tennessee. 186 pp.

Nie, Norman H., Dale H. Bent, and C. Hadlay Hull. 1970. Statistical Package for the Social Sciences. New York: McGraw-Hill. 343 pp.

Oppenheim, A. N. 1966. Questionnaire Design and Attitude Measurement. New York: Basic Books, Inc. 120 pp.

Outdoor Recreation Resources Review Commission. 1962a. Summary Report. Washington, D. C.: Government Printing Office. 246 pp.

_____. 1962b. Wilderness and recreation: a report on resources, values, and problems. Study report No. 3, University of California, Wildland Research Center. 352 pp.

_____. 1962c. The Quality of Outdoor Recreation: As Evidenced by User Satisfaction. Study report No. 5. Washington, D. C.: Government Printing Office. 95 pp.

_____. 1962d. National Recreation Survey. Study report No. 19. Washington, D. C.: Government Printing Office. 394 pp.

_____. 1962e. Participation in Outdoor Recreation: Factors Affecting Demand Among American Adults. Study report No. 20. Washington, D. C.: Government Printing Office. 94 pp.

_____. 1962f. Trends in American Living and Outdoor Recreation. Study report No. 22. Washington, D. C.: Government Printing Office. 257 pp.

Potter, Dale R., Kathryn M. Sharpe, John C. Hendee, and Roger N. Clark. 1972. Questionnaires for research: an annotated bibliography on design, construction, and use. USDA Forest Service Research Paper PNW-140. 80 pp.

Shafer, Elwood L., Jr., and George Moeller. 1971. Predicting quantitative values of recreation participation. In Forest Recreation Symposium Proceedings, U. S. Forest Service, Upper Darby, pp. 5-22.

_____. 1969. The average camper who doesn't exist. USDA Forest Service Research Paper NE-142. 27 pp.

_____, and James Mietz. 1969. Aesthetic and emotional experiences rate high with Northeast wilderness hikers. Environment and Behavior, 1(2):187-197.

Shanks, R. E. 1954. Reference list of native plants in the Great Smoky Mountains. Botany Department, The University of Tennessee. 14 pp. (Mimeographed.)

Snyder, Arnold P. 1966. Wilderness management--a growing challenge. Journal of Forestry, 64:441-446.

Stankey, George H. 1971a. The perception of wilderness recreation carrying capacity: a geographic study in natural resources management. Unpublished Doctoral dissertation on file Michigan State University. 351 pp. Diss. Abs. 1971:1655-B.

_____. 1971b. Wilderness: carrying capacity and quality. Naturalist, 22(3):6-13.

_____. 1971c. Myths in wilderness decisionmaking. Journal of Soil and Water Conservation, 26(5):183-188.

_____, and Sidney S. Frissell, Jr. 1972a. Wilderness environmental quality: search for social and ecological harmony. Paper presented to Society of American Forestry. Proceedings of the 1972 National Convention, Hot Springs, Arkansas, October 1-5. 14 pp.

_____. 1972b. The use of content analysis in resource decision making. Journal of Forestry, 70(3):148-151.

_____. 1972c. A strategy for the definition and management of wilderness quality. In John V. Krutilla (ed.), Natural Environments--Studies in Theoretical and Applied Analysis. Resources for the Future, Inc. Baltimore: Johns Hopkins, pp. 88-114.

Stupka, Arthur. 1960. Great Smoky Mountains National Park, Natural History Handbook Number Five. Washington: Government Printing Office. 75 pp.

_____. 1964. Trees, shrubs, and woody vines of the Great Smoky Mountains National Park, Gatlinburg, Tennessee. 186 pp.

Tennessee Valley Authority, U. S. Forest Service, and Tennessee Game and Fish Commission. 1967. North Fork Citico Creek Watershed study--report for the 1967 water year October, 1966 through September, 1967. Appendix C, pp. 33-52.

United States Bureau of the Census. 1971. General Population Characteristics. United States Summary. PC(1)-B1. Washington, D. C.: Government Printing Office, pp. 253-336.

_____. 1972. General Social and Economic Characteristics. U. S. Summary. PC(1)-C1. Washington, D. C.: Government Printing Office, pp. 337-578.

United States Bureau of Outdoor Recreation. 1966. Trails for America. Bureau of Outdoor Recreation Report of Nationwide Trail Study. Washington, D. C.: Government Printing Office. 155 pp.

United States Congress. 1964. The Wilderness Act, Public Law 88-577. 88th Congress. Washington, D. C. Government Printing Office. 7 pp.

USDA. 1970. U. S. Forest Service. Tellico District Multiple Use Plan. Chapter 100:150-151.

United States Department of Commerce. Bureau of the Census. Statistical Abstract of the United States, 1972. Washington, D. C.: Government Printing Office. 1017 pp.

United States Department of Interior. 1968. National Park Service. Compilation of Administrative Policies. Washington, D. C.: Government Printing Office. 147 pp.

_____. 1970. National Park Service. Areas of the National Park System included in the wilderness study program. 2 pp. (Mimeographed.)

United States Postal Service. 1970. Zip Code Directory. Iowa: Directory Service Company. 76 pp.

Wagar, J. Alan. 1964. The carrying capacity of wild lands for recreation. Forest Science Monograph No. 7, pp. 1-24.

_____. 1966. Quality in outdoor recreation. Trends in Parks and Recreation, 3(3):9-12.

_____. 1969. Estimation of visitor use from self-registration at developed recreation sites. USDA Forest Service Research Paper INT-70. 8 pp.

_____, and Joel F. Thalheimer. 1968. Computer programs for weighting length-of-stay and other visitor characteristics. USDA Forest Service Research Note INT-79. 12 pp.

_____. 1969. Nonconsumptive uses of the coniferous forest, with special relation to consumptive uses. Center for Natural Resources (ed.), September 17-20, 1968. Proceedings of 1968 symposium--Coniferous Forests of the Northern Rocky Mountains, University of Montana Foundation, pp. 255-270.

Wenger, Wiley D., Jr., and Hans M. Gregerson. 1964a. The effect of non-response on representativeness of wilderness-trail register information. USDA Forest Service Research Paper PNW-17. 20 pp.

Wenger, Wiley D., Jr. 1964b. A test of unmanned registration stations on wilderness trails: factors influencing effectiveness. USDA Forest Service Research Paper PNW-16. 48 pp.

Whittaker, R. H. 1956. Vegetation of the Great Smoky Mountains. Ecological Monograph 26, pp. 1-80.

APPENDICES

APPENDIX A

THE QUESTIONNAIRE

INSTRUCTIONS FOR THE ENUMERATOR

1. Identify yourself and your organization (The University of Tennessee) and National Park Service approval of study.
2. Explanation of the study and its purpose.
3. Assure respondent that he will remain anonymous and the information about an individual is confidential.

Example:

Good morning/afternoon, my name is _____, Graduate student in Forestry at The University of Tennessee. I am conducting research on forest recreation uses and specifically hikers and backpackers. This trail study is being done with the approval of the National Park Service. The interview should take no more than ten minutes of your time.

GREAT SMOKIES HIKING STUDY QUESTIONNAIRE (MS-13)

Questionnaire No. ___ ___ ___ Day of week _____

Date _____ ____. ____ Time _____

Weather/Temperature: Sunny ___ Cloudy ___ Sampling Location: _____

1. How many persons are in your group? ____
   Group type? Family ____ B.S.A. ____
   *Peer group ____ Hiking club ____
   Other (specify) _____

2. What are the ages of the people in your group?
   Respondents Age-Sex: M___F___ (head of group only)
   Sex-Age Others: M__, __, __, __
   F__, __, __, __
   Large group (Age range) 7-12___ 13-18___ 19-24___
   25-30___ 31-36___ 37-42___ 43-48___ 49-54___

3. What activities will you be engaging in while on this trip?
   Hiking___ Fishing___ Flora study___
   Primitive camping___ Photography___ Fauna study___
   Campground stay___ Swimming___ Other (specify)_____

4. Length of stay:
   1-day hike___ Weekend stay___ Extended trip (5 day +)
   Overnight___ 2-4 days___ _____(specify)

5. Equipment checklist:
   Backpack: Frame___Canvas___Sleeping bag___Tent___Tarp___
   Rainwear___Pets___
   Footwear: Boots___Canvas___Tools _____

6. How many years have you been hiking?
   Non-hiker_____ 0-1___2-5___6-10___11-20___20+___

7. What is the average number of days you spend hiking per year?
   0-5___6-10___11-20___21-30___30+_____(specify)

8. Are you a member of any conservation or hiking clubs? No___Yes___
   (specify) _____

9. A. What is your preferred hiking company? Alone___One companion___
   Family___Friends___B.S.A.___Hiking club___Other (specify)_____

   B. What is your preferred hiking season? Spring___Summer___
   Fall___Winter___All_____

---

*If peer group randomly select respondent.

10. What is the best source of information about hiking in the Smokies? Park itself___Friends and other hikers___News media___Rec. magazines___ Other Federal publications___State agencies___A.T. Conference___ A.T. guide book___Carson Brewer book___T.V.A.___Others_____

11. A. Are you aware of hiking areas, or opportunities, other than these in the Smokies? Yes___No___Where are they?_____

_____

B. Hiking frequency in these other areas? (no. of times/year) 0-5___6-10___11-20___21-30___30+_____(specify). Percentage of total in other areas? _____

12. Why did you come to the Smokies to hike/backpack rather than some other area? (e.g., National Forest, State park, etc.)

_____

_____

13. Would you like to have trail sections marked at their entrance points as to steepness, difficulty, or time involved? Yes___No___ Comment_____

14. How many hikers could you meet in a day before you would feel there was too much use on any given trail? 0-5___6-10___11-20___21-30___ 30+_____(specify)

15. What is the longest number of days you have spent on an extended backpacking trip?_____(specify)

16. What will be your route while in this area? (Starting point and destination) _____

17. Have you ever spent the night near or in a shelter in the Smokies? Yes___No___ If yes:

A. Which do you prefer? Shelter___Tent___Depends on weather_____
B. In your opinion, what is the optimum number of persons a shelter should accommodate? 0-6___6-10___10-14___14-20___20+___(specify)

18. A. What are your comments about trail/shelter conditions you observed while on this trip?

_____

B. Do you have any objections to horses or riding groups using the same trail you are hiking on? Yes___No___ (Comment)

_____

19. A. Do you think the use of some trails/shelters within the Smokies should be restricted as to use? SA A N D SD (Circle one)

B. What kind of restriction would seem most fair to you personally?

_____

20. A. Would you mind being re-routed to another trail if informed that the use quota was too high or trail conditions were critical for a particular trail? Yes___No___A.T. non-stop hiker___

(Comment)_____

B. If yes, where would you go? Another trail within park___ National Forest___State park___Other (specify)_____

21. Do you think Highway 441 should be closed to all vehicles through the Smokies provided some means of public transportation is furnished within the park? Yes___No___

(Comment)_____

22. Residence: _____
City or town State Zip Code

23. Education: 8th grade___High school___Some college___Jr. College___ College graduate___Some graduate work___M.A.___M.S.___ ph.D___Seminary___

24. Occupation: _____

25. Marital status: Single___Married___
Do you have children? Yes___No___Ages___, ___, ___, ___, ___, ___

26. Combined income of household? Under $4,000___$4,000-7,000___ $7,000-10,000___$10,000-15,000___$15,000+___Student-H.S.(S)___ (M)___College(S)___(M)___

27. What was the population of the town you lived in as a child? (ages 6-18)

A. 0-5,000____ D. 25-50,000____ G. 500,000+____
B. 5-10,000____ E. 50-100,000____
C. 10-25,000___ F. 100-500,000____

28. What is the population of the town you now live in?

A. 0-5,000____ D. 25-50,000____ G. 500,000+____
B. 5-10,000____ E. 50-100,000____
C. 10-25,000____ F. 100-500,000____

Additional suggestions/ideas/notations/or comments: _____

_____

APPENDIX B

SAMPLING PERIODS AND CALENDARS

TABLE 18

CALENDAR A--SAMPLING PERIOD I (62 QUESTIONNAIRES)*

Month	Day	Date	Location and Time of Day Visited
APRIL	Saturday	1	West of Dome (1030-1230) East of Gap (1400-1700)
	Saturday	8	East of Gap (1030-1700)
	Saturday	15	Alum Cave (1045-1430)
	Saturday	29	Rainbow Falls (1145-1430)
MAY	Saturday	6	Anthony Ridge (1340-1615)
	Saturday	27	East of Gap (0945-1600)

*This sampling period was used for pre-testing and revision of the questionnaire and some questions were not included for these respondents.

NOTE: Time period April 1 through May 27, 1972.

TABLE 19

CALENDAR B--SAMPLING PERIOD II (176 QUESTIONNAIRES)

Month	Day	Date	Location and Time of Day Visited
JUNE	Thursday	8	East of Gap (AM)
	Friday	9	Smokemont (AM) Elkmont (PM)*
	Saturday	10	Rainbow (AM)
	Sunday	11	Gregory (PM)
	Monday	12	Rainbow (PM)
	Tuesday	13	Elkmont (PM)
	Wednesday	14	Anthony Ridge (PM)
	Friday	16	Rainbow (PM)*
	Saturday	17	West of Dome (AM)
	Sunday	18	Cosby (PM)
	Wednesday	21	West of Dome (AM)
	Friday	23	Smokemont (AM) West of Dome (PM)*
	Saturday	24	Abrams Falls (PM)
	Sunday	25	Cosby (AM)
	Tuesday	27	Deep Creek (AM)
	Thursday	29	Gregory (PM)
	Friday	30	Alum Cave (AM & PM*)
JULY	Saturday	1	East of Gap (PM)
	Sunday	2	Gregory (PM)
	Monday	3	Anthony Ridge (PM)
	Tuesday	4	Alum Cave (AM)
	Wednesday	5	Cosby (AM)
	Friday	7	Elkmont (AM) Abrams Falls (PM)*
	Saturday	8	Deep Creek (PM)
	Sunday	9	Elkmont (PM)
	Monday	10	Abrams Falls (AM)
	Wednesday	12	Gregory (PM)
	Friday	14	Deep Creek (AM) Anthony Ridge (PM)*
	Saturday	15	East of Gap (PM)
	Sunday	16	Smokemont (AM)
	Monday	17	East of Gap (AM)
	Tuesday	18	Cosby (PM)
	Wednesday	19	West of Dome (PM)
	Friday	21	Smokemont (PM)*
	Saturday	22	Deep Creek (AM)
	Sunday	23	Anthony Ridge (PM)
	Tuesday	25	Abrams Falls (PM)
	Wednesday	26	Rainbow Falls (AM)

*Weekend Sample Day.

NOTE: Time Codes (AM=0900-1200) (PM=1400-1700).
Time period June 7 through July 26, 1972.

TABLE 20

CALENDAR C--SAMPLING PERIOD III (150 QUESTIONNAIRES)

Month	Day	Date	Location and Time of Day Visited
JULY	Friday	28	Abrams Fall (AM) Elkmont (PM)*
	Saturday	29	Alum Cave (AM)
	Sunday	30	Smokemont (PM)
AUGUST	Wednesday	2	Cosby (PM)
	Thursday	3	Anthony Ridge (AM)
	Friday	4	Anthony Ridge (AM) Smokemont (PM)*
	Saturday	5	Gregory (AM)
	Sunday	6	Abrams Falls (AM)
	Wednesday	9	Deep Creek (PM)
	Thursday	10	Cosby (PM)
	Friday	11	Abrams Falls (AM)
	Saturday	12	Cosby (AM)
	Sunday	13	Rainbow Falls (PM)
	Monday	14	Rainbow Falls (AM)
	Tuesday	15	West of Dome (PM)
	Wednesday	16	Smokemont (PM)
	Thursday	17	Abrams Falls (PM)
	Friday	18	West of Dome (AM) East of Gap (PM)*
	Saturday	19	East of Gap (AM)
	Sunday	20	Cosby (AM)
	Monday	21	Rainbow Falls (PM)
	Tuesday	22	Alum Cave (PM)
	Wednesday	23	Anthony Ridge (AM)
	Friday	25	Anthony Ridge (AM)
	Saturday	26	West of Dome (PM)
	Sunday	27	Alum Cave (PM)
	Monday	28	Alum Cave (AM)
	Wednesday	30	Elkmont (AM)
SEPTEMBER	Friday	1	Gregory (AM) Smokemont (PM)*
	Saturday	2	East of Gap (AM)
	Sunday	3	Gregory (AM)
	Tuesday	5	West of Dome (AM)
	Wednesday	6	Gregory (AM)
	Friday	8	Elkmont (AM) East of Gap (PM)*
	Saturday	9	Deep Creek (PM)
	Sunday	10	Rainbow Falls (AM)
	Monday	11	Elkmont (AM)
	Tuesday	12	Deep Creek (PM)

*Weekend Sample Day.

NOTE: Time Codes (AM=0900-1200) (PM=1400-1700).
Time period July 27 through September 14, 1972.

TABLE 21

CALENDAR D--SAMPLING PERIOD IV (115 QUESTIONNAIRES)**

Month	Day	Date	Location and Time of Day Visited
AUGUST	Wednesday	16	Alum Cave (1120-1400)
	Thursday	17	Abrams Falls (1205-1340)
	Tuesday	22	Alum Cave (1200-1330)
	Tuesday	29	Alum Cave (1330-1505)
	Wednesday	30	East of Gap (1200-1515)
	Thursday	31	Abrams Falls (1130-1400)
SEPTEMBER	Wednesday	6	Alum Cave (1400-1630)
	Thursday	7	Abrams Falls (1200-1600)
	Friday	8	Alum Cave (1430-1505)*
	Monday	11	Alum Cave (1050-1210)
	Tuesday	12	Alum Cave (1050-1445)

*Weekend Sample Day.

**This sampling period was used for supplementary data gathering to increase the sample size, and was conducted at random times.

NOTE: Time period August 16 through September 12, 1972.

TABLE 22

CALENDAR E--SAMPLING PERIOD V (55 QUESTIONNAIRES)

Month	Day	Date	Location and Time of Day Visited
OCTOBER	Saturday	14	Gregory (AM) Abrams Falls (PM)
	Tuesday	17	East of Gap (AM) Elkmont (PM)
	Saturday	21	Alum Cave (AM)
	Sunday	22	Elkmont (PM)
	Tuesday	24	West of Dome (AM)
			Anthony Ridge (PM)
	Saturday	28	West of Dome (AM)
	Sunday	29	East of Gap (AM)
	Tuesday	31	Rainbow Falls (AM) Alum Cave (PM)
NOVEMBER	Saturday	4	Rainbow Falls (PM)
	Sunday	5	Anthony Ridge (PM)
	Tuesday	7	Gregory (AM) Abrams Falls (PM)

NOTE: Time Codes (AM=0900-1200) (PM=1400-1700).
Time period October 14 through November 7, 1972.

APPENDIX C

DESCRIPTION OF TRAIL SAMPLING LOCATIONS

DESCRIPTION OF TRAIL SAMPLING LOCATIONS INCLUDED IN THE INTERVIEW SURVEY*

A. High-Use Trails

1. Abrams Falls

Accessible from the Cades Cove loop road at Abrams Falls parking area, the trails begin after crossing Mill Creek, a tributary of Abrams Creek, at an elevation of 1,900 feet. After crossing the bridge to this creek the trail leads 2.5 miles to Abrams Falls. The grade is fairly even except for three major points where the trail crosses piney ridges. The second of these ridges served as the sampling location. At this point, approximately halfway (1.25 miles), there is a natural resting point for hikers going to or coming from the falls. Most hikers like the complete distance to the falls and return (5.0 miles).

One of the main reasons this trail is popular is because it is off the one-way loop road in the Cove going toward Becky Cable Mill, which is one of the pioneer attractions in the park, and is visited by many people (approximately 362,000) each year. Also, Cades Cove campers like to hike this trail, using it as a picnic excursion for the family to the Falls. The trail is used intensively on weekends and takes great impact from hiking use throughout the summer and fall of the year.

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*See Figure 1, page 15, for location.

2. Alum Cave Bluffs

This extremely popular trail leaves U. S. Highway 441 at the Alum Cave Bluffs parking area about nine miles up the mountain from Park Headquarters at Gatlinburg. At an elevation of 4,000 feet, it crosses and recrosses Alum Cave Creek for the first 1.3 miles. The trail winds through thick growths of rhododendron before reaching a forest type composed of yellow birch and hemlock. At 1.25 miles a formation of black slate which started as a crack thousands of years ago forms what is called Arch Rock. Weathering and frost action caused its growth and the trail climbs through it on a flight of stone steps. The next point of interest beyond this rock formation and through the rhododendron, laurel, sand myrtle, and heath balds is Alum Cave Bluffs (an overhanging wall of black slate). Continuing three more miles brings the hiker to the third highest peak in the park--Mt. Le Conte at 6,593 feet above sea level. Le Conte Lodge, maintained under a lease arrangement with the National Park Service, furnishes housing facilities for approximately 50 overnight guests who sleep in eight log cabins. In a recent six and one-half month season the lodge accommodated 6,800 overnight guests, although the average rate is 4,000 annually. There is also a primitive camping area in use in addition to the Appalachian Trail shelter on Le Conte.

Five major trails lead to Le Conte, which adds to its popularity. Alum Cave Bluffs trail (5.2 miles) is the shortest route to or from Le Conte. The interviewing point for this trail and route was situated approximately one mile from the Alum Cave Bluffs parking area at the last metal interpretive sign before reaching Arch Rock. This location

was chosen because of the natural resting place near a stream vista and at the interpretive marker.

This trail has a variety of things to offer both the casual dayhiker and the more serious backpacker. Definite points of interest, coupled with excellent trail design along streams, enhance the beauty and variety of this route.

3. East of Newfound Gap

The Appalachian Trail leaves U. S. Highway 441 at the Newfound Gap parking area (5,000 feet in elevation) and traverses 31 miles eastward towards Davenport Gap before this "famed" stretch of trail leaves the park. The interviewing location was situated approximately one-half mile from the Newfound Gap parking area at the registration box. This point afforded a resting place for hikers and approaching respondents could be easily seen. Trees, flowers, ferns, mosses, and lichens cover nearly every part of the area except the trail itself. Rainfall is heavy and rhododendron and laurel grow out of rock ledges and shallow soil.

The Appalachian Trail affords the hiker many alternative side trails, but the Appalachian Trail is primarily a ridge trail and any side routes are downhill from it. Many hikers enjoy the peaks, vistas, and ease in hiking this type of crest trail through the park.

Electronic eye (diode) trail counters were used on the Appalachian Trail during the study period, by park service officials, and were read at random intervals for some measure of impact upon the trail. Unfortunately, there was no systematic recording or counting procedure to facilitate measurement of use during specified periods of time.

4. Rainbow Falls

This trail is easily accessible by a loop motor road a short distance from downtown Gatlinburg. From Cherokee Orchard, where the trail originates, the hiker travels through cove hardwoods, hemlock, and many types of mixed deciduous forest types. By following Le Conte Creek, the trail, approximately 3.0 miles from Cherokee Orchard, passes Rainbow Falls on the way to Mt. Le Conte. About 2.5 miles from the Orchard a horse trail joins the hiking trail to Le Conte coming from the stables located near the Gatlinburg visitor center. Beyond the falls is Rocky Spur Ridge and the slope becomes more steep as one approaches Le Conte.

The interview location on this trail was situated approximately one mile from the trailhead overlooking the creek at a wedge-shaped rock. This location afforded a good view in both directions and offered a breathing spot for tired hikers and backpackers.

B. Intermediate-Use Trails

5. Anthony Ridge

Accessible from Highway 73, this trail starts at the upper end of the Cades Cove picnic area. The trail leads to Spence and Russell Fields on the Appalachian Trail, and for about two miles stays close to Anthony Creek which contains some big tulip poplars, hemlocks, basswoods, and other cove hardwoods in this vicinity.

The interviewing was conducted approximately 1.5 miles from the picnic area at the registration box where the fire road crosses the first stream. Many of the interview locations were chosen at these

registration boxes because hikers tend to stop and sign the sheets placed in the box. It was observed that these registrations boxes were neither effective nor applicable in gathering vital hiking input data.

Anthony Ridge affords a major access to the Appalachian Trail and many backpackers use this access to reach Spence Field shelter and travel eastward on the Appalachian Trail via Thunderhead Mountain to Clingmans Dome. The loop to Gregory Bald and back down to Cades Cove is another popular route. Anthony Ridge and Creek join the Bote Mountain Road to Spence Field while Russell Field has its own trail joining Anthony Creek trail via Cades Cove picnic area.

6. Gregory Ridge

This trail is located approximately four miles south of the entrance to Cable Mill, in Cades Cave. For the first two miles the trail is located in Forge Creek Valley where large hemlock and tulip poplar trees grow. The Giant Poplar, a specific attraction, is located approximately one mile from the entrance to this trail. The interview location was only about one-half mile from this same entrance. A level section was chosen because of its maximum viewing range, location from the entrance, and distance for dayhikers.

Traveling up the mountain or ridge, hardwood and pine are dominant on Gregory Ridge. Gregory Bald (4,948 feet in elevation), however, is of special interest in late June because of its outstanding display of flaming azalea. Gregory Bald comprises approximately 200 acres and is the third largest of the balds in the park.

7. West of Clingmans Dome

Clingmans Dome, the highest point in the park (6,642 feet) and second highest point east of the Mississippi River, is a major scenic attraction of thousands who come to the Great Smokies. Accessible by a paved trail from the Forney Ridge parking area or by the Appalachian Trail from Newfound Gap, it affords the tourist and the hiker a panoramic view from the 45-foot spindle concrete tower.

Interviews were taken three-fourths of a mile from the parking area where the Forney Ridge trail meets the Appalachian Trail. This point is approximately 50 yards from the registration box on a rock ledge overlooking Fontana Lake to the south and Pigeon Forge to the north. This location was selected in order to interview dayhikers making the loop from the Dome to this scenic vista and back via a lower trail to the Forney Ridge parking lot.

Clingmans Dome is a favorite westward access point located approximately halfway through the park on this 68-mile trail within the park.

C. Low-Use Trails

8. Low Gap from Cosby

Cosby campground, accessible by State Highways 73 and 32, contains facilities for tent camping as well as pull-ins. Facilities include 230 campsites, a large picnic area, nature trail, and flush type sanitation facilities. Tent camping is more suitable because of steepness in the area with few level pull-in sites available.

The entrance to the trail is located southeast of the campground on a fire-road leading 2.6 miles to Low Gap (4,242 feet) on the

Appalachian Trail. The trail initially passes through some large virgin hemlock, then pine, birch, and beech stands as it increases in elevation.

The interviewing location was approximately one mile from the fire road gate near the registration box. This was located near the first stream crossing at Cosby Creek. This trail is generally uphill with a steep slope ascending to the Appalachian Trail. As an eastern access to the Appalachian Trail, it is primarily used by backpackers traveling toward Mount Cammerer or Newfound Gap.

9. Elkmont (Jakes Creek)

Elkmont campground (elevation 2,150 feet), a year-round popular campground site, contains 340 camping sites with five group sites available, a large picnic area, amphitheater, and flush-type sanitation facilities. Relatively crowded most of the summer months, this campground is eight miles west of Gatlinburg and off U. S. Highway 441.

The trail entrance during the study period was located off a short motor road behind the campground near some private cottages. The trail begins at Jakes Creek, traveling southwest towards the Appalachian Trail. One-fourth of a mile beyond the entrance two side trails join into the main trail. This was where the sampling location was established. The trail to the left (Cucumber Gap trail) leads to the Little River Truck trail and the right trail leads to the Sinks via Meigs Mountain. One mile from the entrance the trail leaves the dead-end fire road and proceeds south to Dripping Springs Mountain, Miry Ridge, and Buckeye Gap on the Appalachian Trail.

10. Smokemont

Smokemont campground (2,198 feet) contains 181 campground sites with eight group sites available. Also wood and supplies can be acquired at a camp store which is centrally located.

The trail entrance is located beyond a gate at the northern end of the campground where the trail begins on an undeveloped jeep road and follows closely Bradley Fork Creek. A fork in the trail, approximately 1.5 miles from the campground, was designated as the sampling point. The left fork leads to Richland Mountain and the right fork to Pecks Corner from the Hughes Ridge Trail. This location was chosen to interview horse groups, dayhikers from the campground, and backpackers going to or returning from the Appalachian Trail.

One disadvantage of this trail being on the jeep road was that impact could not be readily seen and the trail was not particularly inviting to dayhikers.

11. Deep Creek

Accessible by U. S. Highway 19, approximately two miles north of Bryson City, is Deep Creek campground and ranger station. Deep Creek (1,800 feet above sea level) contains 128 campsites with six group camping sites.

The trail entrance is located on a jeep road for approximately 1.5 miles switching back and forth across Deep Creek by way of wooden bridges. One thousand feet beyond the entrance of this trail a 60-70 foot waterfall (Toms Branch Falls) can be seen.

The sampling interview location was located approximately one-half mile from where the jeep road forks. This spot was chosen at the head of the loop trail to Indian Creek Falls and Deep Creek to facilitate off-the-road hikers and hikers from the Appalachian Trail via Noland Divide, Upper Sassafras Gap, or Thomas Divide. Also some dayhikers from the campground were to be expected at this location. Initial terrain is rough and rocky through virgin and reproducing northern hardwoods. Increasing in elevation, one passes through virgin oak and chestnut, virgin spruce, and fir.

APPENDIX D

INFORMATIONAL STATEMENT AND EXAMPLE

OF BACKCOUNTRY PERMIT

UNITED STATES DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

Great Smoky Mountains National Park
Gatlinburg, Tennessee 37738

June 1, 1972

INFORMATIONAL STATEMENT CONCERNING RATIONING OF BACKCOUNTRY USE WITHIN GREAT SMOKY MOUNTAINS NATIONAL PARK

A camping permit is required in order to stay overnight at any backcountry area within Great Smoky Mountains National Park. This permit will be issued without charge at any ranger station, visitor center, or at Park Headquarters upon your arrival in the park. In order to issue the camping permit we will have to know where you plan to start and end your hike, where you intend to spend each night, and the number of persons in your party.

There are some trail areas where a marked deterioration of natural resources has been taking place and where sanitation facilities have been extremely overtaxed because too many overnight hikers have occupied the same area for too long. Effective June 5, 1972, these areas will be "rationed," and include: the entire Appalachian Trail within Great Smokies; and four scattered but extremely popular shelter areas - Mt. LeConte, Kephart, Laurel Gap, and Moore Spring. Use of these areas will be limited to the design capacity of each shelter. When the shelters have been filled to capacity, hikers will be directed to the more than 500 miles of trail receiving less impact.

The new rules affect only about ten per cent of the park's total trail system that is available to hikers. One of the primary goals of the rationing program is to introduce hikers to the less crowded trails and thereby enhance their enjoyment of the park. This program will not affect day only hikers, or normal visitor use of developed areas within the park.

If you plan to hike outside the rationed areas, we should be able to issue a camping permit for your first preference, and normally permits for these areas can be issued by mail as in the past.

OVERNIGHT USE OF RATIONED AREAS: Camping permit required and will be issued upon your arrival at the park no more than 24-hours in advance of departure on trail, providing there is space available. We do suggest that you plan an alternate hike outside the rationed areas. Listings of trailside campsites are available upon request for advance planning.

We are aware of the special needs of organized hiking groups, such as Boy Scouts, and every consideration will be given these groups so that they will not have to curtail traditional summer outings.

We would prefer not to view the rationing as a set of restrictions but instead as a cooperative effort by the park and hiker to save our natural resources by keeping use in these few extremely popular over-crowded areas at a more optimum level.

The Appalachian Trail receives little use as it passes through the national forest areas surrounding the park, and there will be no rationing in the national forest areas. The Appalachian Trail northeast of Davenport Gap is in the Cherokee and Pisgah National Forests, and information can be obtained by writing to:

Forest Supervisor
Cherokee National Forest
P. O. Box 400
Cleveland, TN 37311

or

Forest Supervisor
National Forests in North Carolina
P. O. Box 2750
Asheville, NC 28802

The Appalachian Trail south of Fontana Dam is in the Nantahala National Forest and information is available at the Asheville address above.

Sincerely yours,

Vincent Ellis
Superintendent

NOTE: Used with permission of Superintendent, Great Smoky Mountains National Park.

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
Great Smoky Mountains National Park
North Carolina--Tennessee

BACK COUNTRY CAMPING PERMIT

For camping only at designated sites on dates listed.

Site	Date

I agree to comply with Safe Practices, Good Manners, and Regulations listed on reverse.

_____
(Signature of Permittee)

Issued to: _____

Address: _____

City: _____ State: _____ Zip: _____

Vehicle License No. _____ State: _____

Starting from: _____

Ending at: _____

_____ _____
Date (Signature of Issuing Official)

Hiking	Fishing	Horse back	Camp-ing	BSA	Re-route Yes	Re-route No	No. in Party	No. of Nights

Permit (continued)

BACK COUNTRY USE REGULATIONS

1. All overnight hikers must have a camping permit.

2. Bicycles, pets and motorized equipment are prohibited on trails. Firearms and fireworks are not permitted in the park.

3. All non-burnable trash packed in must be carried out with you. Never bury or throw trash in pit toilets. Littering is prohibited.

4. Put out your fire before leaving.
   Never leave a fire unattended.
   Build fires at designated sites only.

5. Only dead and down wood may be used for fires.
   Curring of live trees and shrubs is prohibited.

6. Hitching horses within immediate vicinity of shelters or to trees is prohibited. Horses are prohibited on the Appalachian Trail except at designated trail crossings.

7. Feeding of wildlife is prohibited.

8. Camping outside the sites and dates specified on the camping permit, or violation of any of the above regulations is subject to prosecution.

9. If for any reason you are unable to stay for the length of time specified on the permit, please notify the nearest ranger station so that the space may be used by another camper.

SAFETY PRECAUTIONS

To safeguard health, boil or chemically treat water in streams or springs before drinking.
Hiking groups - stay together or in pairs. If lost stay on the trails or roads.
Rocks at waterfalls and streams are slippery and hazardous.

NOTE: Used with permission of Superintendent, Great Smoky Mountains National Park.

APPENDIX E

QUESTIONNAIRE DATA TABLES FOR ALL RESPONDENTS

TABLE 23

FREQUENCY DISTRIBUTION OF GSMNP RESPONDENTS TO STUDY QUESTIONNAIRE
BY MAJOR USER GROUPS AND BY CERTAIN SAMPLING STRATA

N=Number of questionnaires	Sampling Periods																					
	I (N=62)				II (N=176)				III (N=150)				IV (N=115)				V (N=55)				TOTAL	
Calender schedule---------	A				B				C				D				E					
Dayhikers and backpackers-	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
Percentage and frequency--	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
Trail sampling location:																						
Abrams Falls					22	39	1	2	23	34	1	1	31	36			22	12			22	124
Alum Cave Bluff	8	5	8	5	11	20	6	11	13	19	3	5	55	63	5	6	22	12	5	3	27	149
Cosby					2	3	3	6	2	3											2	12
Deep Creek					1	1															*	1
West of Clingmans Dome	21	13	16	10	2	4	4	8	7	10	9	13					4	2			11	60
Elkmont (Jakes Creek)					1	2	2	3									4	2	1	1	1	7
East of Newfound Gap	5	3	31	19	13	22	4	8	7	11	5	8	4	4	5	6	11	6			16	88
Gregory Ridge					3	6	4	7	1	1	1	1					7	4			3	19
Rainbow Falls	3	2	5	3	6	11	2	4	19	29							18	10			11	59
Smokemont					2	4	2	4	1	1											2	9
Anthony Ridge (Spence)			3	2	3	6	3	5	5	7	5	7					5	3			5	30

TABLE 23 (continued)

N=Number of questionnaires Calender schedule---------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
1. How many persons are in your group?																						
Lone hiker	1	1	1	1	6	11	10	17	3	5	3	5	6	7	1	1	4	2	2	1	9	51
(2-3)	21	13	42	26	34	60	15	26	42	63	11	17	66	76	5	6	64	35	2	1	58	323
(4-5)	13	8	13	8	19	33	2	3	25	37	6	9	16	18	4	4	24	13			24	133
(6-7)			3	2	3	6	2	4	4	6			2	2			2	1	2	1	4	22
(8-14)	2	1	3	2	3	5	3	5	3	4	1	2							2	1	4	20
(15+)					2	3	2	3			1	2			1	1					2	9
Group type?																						
Family(ies)	23	14	18	11	51	89	11	20	62	93	4	6	70	80	3	3	71	39	5	3	64	358
Peer	14	9	44	27	13	23	19	34	14	21	16	24	20	23	7	8	22	12	2	1	33	182
B.S.A. or G.S.A.			2	1	1	2	1	2			3	4									2	9
Church							1	2	1	1											1	4
Hiking club					1	1					1	1									*	1
Horse					1	2															*	2
Y.M.C.A. or Y.W.C.A.					1	1									1	1					*	2

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
2. Age of respondent																						
(16-17)	3	2	5	3	4	7	6	11	3	5	5	7	1	1	4	4	2	1			7	41
(18-21)	6	4	18	11	8	15	6	10	7	11	5	8	14	16	2	2	13	7			15	84
(22-35)	13	8	34	21	23	41	15	27	31	47	11	17	42	48	4	4	40	22	5	3	43	238
(36-50)	11	7	6	4	26	46	5	9	27	41	1	2	27	31	1	1	29	16	2	1	28	158
(50+)	3	2			5	9	1	1	7	11	1	1	6	7	1	1	9	5			7	37
Sex of respondent																						
Male	34	21	58	36	62	109	27	47	74	111	22	33	83	95	9	10	82	45	7	4	92	511
Female	3	2	5	3	5	9	6	11	3	4	1	2	7	8	2	2	11	6			8	47
Number of children in family:																						
None	21	13	50	31	30	52	23	41	34	51	20	30	45	52	9	10	45	25	5	3	55	308
One	3	2	5	3	6	10	2	4	5	8	2	3	11	13			9	5			9	48
Two	5	3			13	23	4	8	17	26	1	1	16	19	2	2	27	15	2	1	18	98
Three	5	3	2	1	8	14	2	4	12	18	1	1	13	15			11	6			11	62
Four	3	2	3	2	7	12	1	1	5	8			4	4							5	29
Five			3	2	2	4			1	2											1	8
Six					2	3			1	2											1	5

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
Age of oldest in the group:																						
(16-17)			5	3	2	3	3	5	1	1	2	3			1	1					3	16
(18-21)	5	3	6	4	7	12	7	12	7	10	7	10	11	13	3	3	13	7			13	74
(22-35)	14	9	44	27	23	40	16	28	29	43	13	19	42	48	4	5	38	21	5	3	44	243
(36-50)	13	8	8	5	28	50	6	11	31	46	1	2	28	32	1	1	31	17			31	172
(51-80)	5	3			7	13	1	2	10	15	1	1	9	10	2	2	11	6	2	1	10	53
Age of youngest in the group:																						
(0-4)	1	1			4	8	1	1	10	10			7	8			4	2			5	30
(5-9)	1	1	3	2	12	21	3	5	15	22	1	1	9	10			5	3			12	65
(10-13)	6	4	3	2	9	16	4	7	7	11	3	5	7	8	1	1	7	4			10	58
(14-17)	3	2	6	4	8	14	7	13	5	7	5	8	4	4	3	3	7	4	2	1	11	60
(18-21)	8	5	23	14	11	20	7	12	14	21	7	10	21	24	4	4	18	10			22	120
(22-35)	10	6	27	17	12	21	11	20	21	32	7	10	25	29	2	2	24	13	4	2	27	152
(36-50)	6	4			8	14			5	7	1	1	14	16	1	1	20	11	2	1	10	55
(51-70)					2	4			3	5			4	4	1	1	7	4			3	18

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
Mean age of large group (excluding leaders):																						
No large group	36	22	56	35	64	113	29	51	75	113	21	31	90	103	10	11	91	50	7	4	96	535
(13-17)	2	1	2	1	1	2	3	6	1	2	3	4			1	1					3	17
(18-21)			3	2													2	1			1	3
(22-35)							1	1													*	1
(36-50)			2	1	1	1															*	2
3. What activities will you be engaging in while on this trip?																						
a. Primitive camping			61	38			31	54			21	32			9	10			7	4	25	138
b. LeConte Lodge	5	3	1	1	2	2	3	4	1	2	2	3	2	2	2	2					4	20
c. Campground stay					13	23	4	7	25	38	2	3	37	43	3	3	45	25			25	142
d. Photography	6	4	24	15	27	47	13	23	27	40	13	20	31	36	4	5	47	26	2	1	39	217
e. Fishing			3	2	3	5	2	3	3	5											3	15
f. Horseback riding					1	2															*	2
g. Flora study	3	2	2	1	2	3	6	11	1	2	3	5					2	1			4	25
h. Fauna study					1	1	4	7			2	3					2	1			2	12

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
4. Length of stay in days																						
One day only	37	23			67	118			77	115			90	103			93	51			74	410
(2-3)			50	31			19	34			3	4			3	3			4	2	13	74
(4-5)			8	5			4	8			14	21			5	6			2	1	7	41
(6-7)			2	1			4	7			4	6			3	3			2	1	3	18
(8-14)			3	2			4	7			3	4									2	13
(15+)							1	2													*	2
5. Equipment checklist:																						
a.Frame backpack	5	3	53	33	2	3	26	45	2	3	22	33	2	2	9	10	2	1	7	4	25	137
b.Canvas backpack	8	5	5	3	6	11	8	14	1	2	6	9	2	2	4	4	2	1	2	1	9	52
c.Boots	27	17	61	38	14	25	31	54	8	12	21	32	13	15	9	10	22	12	7	4	39	219
d.Shoes	10	6	2	1	53	93	2	3	68	102	2	3	76	87	2	2	71	39			60	336
e.Sleeping bag	3	2	52	32	1	1	27	47	1	1	21	32			10	11			7	4	23	130
f.Tent and/or tarp			34	21	1	2	19	33			20	30			6	7			5	3	17	96
g.Raingear	2	1	53	33	1	2	27	47			21	31			9	10	2	1	7	4	23	129
h.Pets	3	2	2	1					2	3	1	1	1	1							1	8

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
6. How many years have you been hiking?																						
Non-hiker	2	1	2	1	13	23	4	7	17	26	1	1	28	32	1	1	27	15			19	107
(0-1)	5	3	5	3	3	5	4	8	9	14	3	4	10	11	1	1	11	6			10	55
(2-5)	18	11	21	13	23	40	11	19	23	34	13	19	24	28	7	8	27	15	4	2	34	189
(6-10)	5	3	19	12	18	31	7	13	15	22	5	7	16	18	1	1	13	7	2	1	20	115
(11-19)			13	8	6	11	6	10	7	10	2	3	6	7			7	4	2	1	10	54
(20+)	8	5	3	2	4	8	1	1	6	9	1	1	6	7	1	1	7	4			7	38
7. What is the average number of days you spend hiking per year?																						
(0-5)	13	8	6	4	31	54	7	13	30	45	5	7	52	60	4	4	44	24	2	1	39	220
(6-10)	8	5	18	11	18	31	9	16	27	41	4	6	18	21	2	2	31	17	2	1	27	151
(11-20)	11	7	16	10	9	16	11	19	8	12	9	14	10	12	4	4	16	9	2	1	19	104
(21-29)	2	1	5	3	6	11	1	2	5	7	4	6	4	4	1	1	2	1	2	1	7	37
(30+)	3	2	18	11	3	6	4	8	7	10	1	2	5	6	1	1					8	46

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
8. Are you a member of any conservation or hiking clubs?																						
a.Smoky Mtn. Hiking club	2	1					1	1	1	1	1	1									1	4
b.Applachian trail Conf.	2	1	2	1			1	2			1	1									1	5
c.Sierra club			5	3	1	2	3	5	1	1	1	2			1	1	4	2	2	1	3	17
d.Audubon society					1	1	2	3	1	2					1	1					1	7
e.B.S.A.	2	1			3	6	3	6	3	4	4	6	2	2	1	1	4	2	2	1	5	29
f.G.S.A.			2	1																	*	1
g.National wildlife soc.			2	1			3	5	1	2	1	1			1	1	2	1			2	11
h.Nat.Parks & Cons. Assoc							1	1	1	1	1	2			1	1					1	5
i.Friends of the Earth			2	1			1	1													*	2
j.Camping & Hiking Assoc.					1	1	1	1													1	3
9.a.What is your preferred hiking company?																						84
Alone	2	1	10	6	6	11	4	7	4	6	3	5	1	1	1	1	2	1			7	39
One companion	2	1	5	3	4	8	14	25			3	4			1	1	5	3	2	1	8	46
Peer group	16	10	42	26	15	27	9	15	13	19	14	21	15	17	7	8	13	7			27	150
Family	18	11	6	4	41	72	6	10	60	90	2	3	74	85	2	2	73	40	5	3	57	320
B.S.A.							1	1			1	1									*	2
Hiking club											1	1									*	1

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
9.b.What is your preferred hiking season?																						
Spring	8	5	15	9	10	17	6	10	7	10	3	4	5	6	1	1					11	62
Summer	6	4	8	5	37	65	11	19	46	69	9	14	37	43	4	4	11	6			41	229
Winter			2	1	1	2	1	2													1	5
Fall	6	4	8	5	7	13	6	11	19	28	1	2	33	38	2	2	54	30			24	133
All of the above	16	10	31	19	12	21	9	16	5	8	10	15	14	16	4	5	27	15	7	4	23	129
10. What is your best source of information about hiking in the Smokies?																						
Chamber of commerce					1	1	1	2			1	1	5	6	1	1					1	11
Park itself	18	11	31	19	38	67	9	15	53	80	8	12	63	72	5	6	60	33	2	1	57	316
Friends & hikers	10	6	14	9	13	23	6	10	15	22	8	12	13	15	1	1	18	10	4	2	20	110
News media					1	1			1	1											*	2
Federal publications	6	4	3	2	3	5	4	7	1	1			2	2							4	21
A.T. Conference	2	1	5	3	1	2	4	7			1	2									3	15
A.T. guide book	2	1	8	5	2	3	6	10	1	2	4	6	1	1	2	2	2	1			6	31
Brewer trail guide					4	8	1	1	2	3	1	1	3	3	1	1	4	2			3	19
Experience					2	3	3	5	2	3	1	1	2	2			9	5	2	1	4	20
AAA			2	1	3	5	1	1	2	3			2	2	1	1					2	13

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																			
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
11. a. Are you aware of hiking areas, or opportunities, other than these in the Smokies?																						
No					19	34	4	8	27	41	3	4	34	39	8	9	38	21	7	4	31	160
Yes	19	12	48	30	42	74	24	43	49	74	21	31	55	63	26	3	53	29			69	359
																						519
If so, where are they?																						
State parks--North	2	1	13	8	19	34	9	16	21	32	7	11	30	35	4	5	25	14	5	3	44	159
State parks--South	5	3	19	12	18	32	5	9	21	31	9	13	19	22	3	3	34	19	4	2	41	146
Natn'l parks--East	2	1	6	4	7	12	6	10	7	11	7	10	9	10	2	2	9	5			18	65
Natn'l parks--West	5	3	2	1	4	7	6	11	9	14	5	7	12	14			20	11	5	3	20	71
U.S.F.S.--Northeast	3	2	6	4	7	13	6	11	5	8	6	9	12	14	3	3	2	1			18	65
U.S.F.S.--South	5	3	10	6	12	21	7	12	13	19	11	16	12	14	3	3	14	8	2	1	29	103
U.S.F.S.--West	2	1	5	3	4	8	5	9	3	5	3	4	5	6			2	1	2	1	11	38
Private areas and wilderness areas			5	3	4	7	7	13	7	10	3	4	5	6	1	1	9	5	2	1	14	50

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
11. b. Hiking frequency in these other areas? (Number times/year)																						
(0-5)	14	9	24	15	35	62	16	29	31	46	16	24	44	50	4	5	38	21	4	2	72	267
(6-10)	3	2	8	5	2	3	5	9	11	17	2	3	4	4	2	2	45	25			13	48
(11-20)	2	1	8	5	2	3	2	3	4	6	1	2	5	6	1	1	5	3	4	2	8	31
(21-29)			3	2	1	1			1	1			3	3			4	2			2	7
(30+)			5	3	3	5	1	2	3	4	1	2	1	1	1	1					5	18
																						371
Percentage of total in other areas?																						
0-25%					10	18	8	15	18	27	9	13	20	23	8	3	20	11	2	1	38	111
26-50%					2	4	3	6	4	6	4	6	4	5			4	2	2	1	10	30
51-75%					3	5	1	2	4	6	2	3	4	5	1	1	4	2			8	24
76-100%					17	29	2	4	23	35	6	9	27	31	4	5	27	15	4	2	44	130
																						295

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
12. Why did you come to the Smokies to hike/ backpack rather than some other area, ex. National Forest, State park, etc...?																						
Love the mountains	8	5	24	15	9	16	8	14	7	11	6	9	10	11	1	1	2	1			15	83
Accessible, close	15	9	16	10	13	23	6	11	11	16	4	6	13	15	2	2	31	17			20	109
Never been before	3	2	2	1	8	14	7	13	15	22	6	9	16	19	2	2	7	4	4	2	16	88
Been before, came back	2	1	2	1	7	12	1	1	10	15	1	2	10	11	1	1	5	3			8	47
Come every year					3	5							4	4			4	2			2	11
Best in the East	3	2	10	6	1	2	2	4	5	7	4	6			1	1					5	28
On vacation					6	10	2	3	13	19			12	14			4	2			9	48
Passing through					2	3	1	2	1	2			5	6	1	1	7	4			3	18
In Gatlinburg, stopped					1	2			3	4			5	6							2	12
Ignorant of U.S.F.S.					3	5	1	2													1	7
Campers areas.					6	10	1	2	8	12	1	2	11	13	2	2	13	7			9	48
Fall colors																	13	7	2	1	1	8
More knowledgable			2	1	6	11	3	5	2	3	1	1	3	3			5	3	2	1	5	28
To escape the city	2	1	6	4	1	1	1	1	2	3					1	1	2	1			2	12
For fun, experience	5	3	2	1	2	4			1	1			1	1	1	1					2	11

TABLE 23 (continued)

	Sampling Periods																					
N=Number of questionnaires	I (N=62)				II (N=176)				III (N=150)				IV (N=115)				V (N=55)				TOTAL	
Calender schedule---------	A				B				C				D				E					
Dayhikers and backpackers-	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
Percentage and frequency--	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
13. Would you like to have trail sections marked at their entrance points as to steepness, difficulty, or time involved?																						
Yes	19	12	34	21	48	84	17	30	53	80	4	6	60	69	4	5	69	38	2	1	62	346
No	18	11	29	18	19	34	16	28	23	35	19	29	30	34	6	7	24	13	5	3	38	212
Comment																						
Interval markings	2	1	2	1	2	3	2	4	4	6	2	3	3	3							4	21
Interpretive signs			3	2	2	4	1	1	1	1											1	8
Each hiker is diffnt					2	3	2	3					1	1							1	7
Elevation markers			2	1	2	3	1	2	1	2	2	3	2	2							2	13
Better signs			5	3	2	3	1	2	1	2											2	10
Accurate mileage	2	1	2	1	2	4	1	2	1	1			1	1							2	10
Help for others	2	1	2	1	9	15	2	3	2	3	1	1	3	3							5	27
Less signs					1	1	1	1	1	1	1	1									*	4

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
14. How many hikers could you meet in a day before you would feel there was too much use on any given trail?																						
(0-5)			3	2	4	8	3	5	3	5	1	2	9	10	4	5	4	2	4	2	8	41
(6-10)			2	1	3	5	9	16	5	7	5	7	5	6	1	1	9	5	2	1	10	49
(11-20)			6	4	8	14	9	16	12	18	11	16	9	10	3	3	22	12	2	1	18	94
(21-29)			2	1	14	25	6	10	12	18	3	5	16	18	3	3	18	10			18	90
(30+)	3	2	3	2	38	66	6	11	45	67	3	5	51	59			40	22			46	234
15. What is the longest number of days you have spent on an extended backpacking trip?																						508
Never	18	11	6	4	42	73	4	8	54	81	1	1	64	74	1	1	71	39			52	292
(1-4)	8	5	23	14	18	31	14	24	16	24	6	9			4	4			2	1	24	133
(5-7)	6	4	18	11	6	10	6	10	3	5	9	14	13	15	4	4	11	6	2	1	12	67
(8-12)	3	2	6	4	2	3	6	10	1	2	5	7	5	6	1	1	4	2	2	1	6	36
(13-21)	2	1	8	5	1	1	2	3	1	2	2	3	4	4	1	1	4	2	2	1	4	23
(22+)			2	1			2	3	1	1	1	1	4	4	1	1	4	2			1	7

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
16. What will be your route while in this area?(Starting point and destination) **																						
Classification:																						
1. Abrams falls trail					23	40	1	1	23	34	1	1	31	36			24	13			22	125
2. Anthony ridge trail			3	2	3	6	7	13	4	6	3	5					5	3			6	35
3. Alum cave trail	8	5	6	4	11	20	6	10	16	24	3	5	55	63	4	5	22	12	5	3	28	151
4. Rainbow falls trail	3	2	5	3	6	11	1	2	19	29							18	10			10	57
5. East of Newfound Gap	23	14	37	23	13	23	5	9	7	11	2	3	4	4	4	5	7	4			17	96
6. Davenport to Fontana			2	1			1	1			3	4			1	1					1	7
7. Fontana to East			3	2			1	2			1	1									1	5
8. West of Clingmans Dome	3	2	5	3	3	5	3	6	7	10	10	15			1	1	4	2			8	44
9. Low gap--Cosby					2	3	3	6													2	9
10. Elkmont(Jakes creek)					2	3	2	3									5	3	2	1	2	10
11. Gregory ridge trail					3	5	2	3	1	1	1	1					7	4			2	14
12. Smokemont			2	1	1	2	1	2													1	5

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
17. Have you ever spent the night near or in a shelter in the Smokies?																						
Yes	11	7	44	27	11	20	19	34	9	13	18	27	4	5	6	7	11	6	4	2	26	148
No	26	16	19	12	56	98	14	24	68	102	5	8	85	98	4	5	82	45	4	2	74	410
A. If yes, which do you prefer?																						
Shelter	10	6	26	16	8	14	11	19	7	11	17	25	4	4	4	5	11	6	4	2	73	108
Tent or tarp	2	1	18	11	3	5	7	12	1	2	1	2	1	1	2	2					24	36
Depends on weather					1	1	2	3													3	4
B. In your opinion, what is the optimum number of persons a shelter should accommodate?																						
(0-6)	3	2	10	6	1	2	4	7	2	3	1	2					11	6	4	2	20	30
(7-10)	3	2	5	3	1	1	3	6	1	2			1	1							10	15
(11-14)																					0	0
(15-19)					1	1	1	1	1	1											2	3
(20+)					1	2	1	1													2	3
Capacity	5	3	29	18	8	14	11	19	5	7	17	25	4	4	6	7					66	97

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
18.A.What are your comments about trail conditions you observed while on this trip?																						
Good maintenance	3	2	2	1	1	2			1	2			4	4			4	2			2	13
Good condition	27	17	54	30	54	95	26	46	65	97	16	24	80	92	9	10	89	49	5	3	83	463
Poor maintenance	2	1	3	2	3	5	1	2	3	5	2	3	1	1					2	1	4	20
Poor condition			3	2	1	2	1	2	2	3	1	1	3	3							2	13
Rocky	2	1	3	2	3	6	2	4	2	3			1	1	1	1					3	18
Littered,trash	2	1	2	1	1	2	1	1	3	5	4	6	1	1	1	1					3	18
Well marked	2	1			1	1															*	2
Poorly marked			2	1	3	5	2	3			1	1	1	1							2	11

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
18.A.What are your comments about shelter conditions you observed while on this trip?																						
Adequate	10	6	29	18	11	19	6	10	5	7	3	5			1	1					55	66
Inadequate							1	2													2	2
Littered,trashy			3	2	1	2	3	6	1	1	2	3									12	14
Mice problem							1	2	1	1	1	1									3	4
Bear problem							1	1	1	1											2	2
Poor maintenance			2	1	2	3	2	3	3	4	4	6	1	1	1	1					16	19
Enforcement problem					1	2					1	2									3	4
Bear cage needed							1	1			3	4			2	3					7	8
B.Do you have any objections to horses or riding groups using the same trail you are hiking on?																						119
Yes	8	5	27	17	44	77	22	38	42	63	15	23	45	52	2	3	67	37	7	4	60	319
No	8	5	19	12	23	41	11	20	35	52	8	12	44	51	6	9	25	14			40	216
																						535

TABLE 23 (continued)

	Sampling Periods																					
N=Number of questionnaires	I (N=62)				II (N=176)				III (N=150)				IV (N=115)				V (N=55)				TOTAL	
Calender schedule---------	A				B				C				D				E					
Dayhikers and backpackers-	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
Percentage and frequency--	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
Horse objection comment:																						
Damage trails	2	1	5	3	4	8	3	5	6	9	6	9	2	2	1	1					19	38
Seperate trail prefer			2	1	9	16	7	13	18	27	7	11	11	13	1	1	36	20	5	3	51	105
Limit group numbers	2	1			4	7	1	2	1	2	1	1	2	2	1	1					8	16
Fecal mess			6	4	8	14	3	5	5	7	1	1	5	6	1	1	7	4			20	42
Safety hazard for both									1	1			1	1			2	1	2	1	2	4
19.A.Do you think the use of some trails/shelters within the Smokies should be restricted as to use?																						205
Strongly agree	5	3	15	9	13	23	15	27	11	16	17	26	17	20	10	11	20	11	5	3	27	149
Agree	24	15	27	17	12	21	10	17	6	9	3	5	14	16	1	1	16	9	2	1	20	111
Neutral (Don't know)	2	1	3	2	10	17	3	5	15	22	1	2	14	16			29	16			14	81
Disagree	5	3	16	10	13	23	3	5	15	23	1	1	13	15			4	2			15	82
Strongly disagree	2	1	2	1	19	34	2	4	30	45	1	1	31	36			24	13			24	135

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
19.B.What kind of restriction would seem most fair to you personally?																						
Numbers of people	5	3	5	3	6	11	2	3	7	11	1	2	15	17	4	4	22	12			24	66
Group size limit					2	3	1	1	1	1	1	2									3	7
First come,1st serve	3	2	10	6	2	3	3	5	2	3	1	2	5	6							10	27
Spacing/Interval					1	2			1	1			2	2							2	5
Reservation system	3	2	5	3			3	5					1	1							4	11
Current permitsystem	8	5	23	14	10	17	17	30	8	12	16	24	5	6	6	7	11	6	7	4	46	125
Experience,equipment			5	3	1	1	1	1	1	1	1	2	1	1			2	1			4	10
Enforcement standard	2	1	2	1	1	2			1	1											2	5
More trails	3	2			2	4	2	4	1	1			2	2							5	13
20.A.Would you mind being re-routed to another trail if informed that the use quota was too high or trail conditions were critical for a certain trail?																						269
No	13	8	42	26	61	108	26	46	77	115	23	34	90	103	10	12	91	50	7	4	95	506
Yes	3	2	3	2	6	10	7	12			1	1					2	1			5	28
																						534

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=i76) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
Re-route comment:																						
Prefer it			2	1	1	2	1	2	1	1	1	2	1	1	1	1	9	5			32	15
If distance was same			4	8	2	4	1	1													28	13
If same destination			5	9	5	9									2	1					40	19
20.B.If yes, where would you go?																						47
Go back home			2	1			1	1			1	1									11	3
Protest	2	1					1	1													7	2
Another trail in park	2	1	2	1	6	10	5	10									2	1			82	23
21. Do you think Highway 441 should be closed to all vehicles through the Smokies provided some means of public transportation is furnished within the park?																						23
No	3	2	3	2	47	82	11	20	57	85	11	16	63	72	4	4	53	29	2	1	62	313
Yes			13	8	20	36	22	38	20	30	13	19	27	31	7	8	40	22	5	3	38	195
																						508

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
Comment to Highway 441:																						
If gear provisions					1	1	1	2													8	3
Eventually, not now					1	1	1	1	1	2	1	2	1	1							18	7
Prefer private vehicle	2	1			3	6	2	3	2	3			1	1							37	14
No buses					1	2															5	2
Tramway would be good					1	1							2	2							8	3
Prefer no fee					1	2	1	1			1	1									10	4
Would pay fee							1	1													3	1
Would be inconvenient					1	1	1	2													8	3
Yes, but no mass transient system									1	1											3	1
22.ZIPCODE (Residence)***																						38
00000-09999			5	3	1	1			1	2	1	2	4	5							2	13
10000-19999	2	1	8	5	2	3	2	3	3	4	1	1	9	10							5	27
20000-29999	8	5	10	6	8	14	7	13	12	18	2	3	5	6	1	1	16	9			13	75
30000-39999	14	9	23	14	32	56	12	22	32	48	12	18	33	38	3	3	51	28	4	2	43	238
40000-49999	6	4	16	10	19	33	7	12	19	29	7	10	25	29	4	4	22	12	2	1	26	144
50000-59999					1	1	1	1	1	2					1	1					1	5
60000-69999	6	4	2	1	3	5	2	3	3	4			10	11	2	2					5	30
70000-79999					2	4	1	1	4	6	1	1	4	4			4	2			3	18
80000-89999																					0	0
90000-99999					1	1	2	3	1	2					1	1			2	1	1	8

TABLE 23 (continued)

	Sampling Periods																					
N=Number of questionnaires	I (N=62)				II (N=176)				III (N=150)				IV (N=115)				V (N=55)				TOTAL	
Calender schedule---------	A				B				C				D				E					
Dayhikers and backpackers-	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
Percentage and frequency--	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
23. Education																						
Eighth grade			2	1	2	3					1	1									1	5
High school	8	5	13	8	22	38	8	14	23	35	9	13	23	26	5	6	31	17	2	1	29	163
Some college	10	6	21	13	18	31	8	14	21	32	8	12	30	34	2	2	27	15			29	159
College graduate	8	5	21	13	18	31	10	17	28	42	5	8	29	33	3	3	27	15	4	2	30	169
M.A.	2	1			1	2					1	1	1	1							1	5
M.S.	1	1	5	3	2	4	3	6	1	1			5	6	1	1	2	1	2	1	4	24
Ph.D.	3	2	2	1	3	5	1	1	3	4			2	2			4	2			3	17
M.D. or D.D.S.	5	3			2	3	2	4	1	1							2	1			2	12
Seminary					1	1	1	2					1	1							1	4

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
24. Occupation																						
I. Professional	11	7	11	7	11	20	6	10	15	23	2	3	10	12	3	4	15	8			17	94
II. Managers, officials	5	3			7	12	1	1	9	14	3	5	14	16			7	4			10	55
III. Clerical, sales	3	2	10	6	17	30	6	11	13	20			17	20			22	12			18	101
IV. Craftsmen, foremen	2	1	6	4	6	10	2	3	10	15	1	1	10	11			5	3	2	1	9	49
V. Operatives, laborers	3	2	2	1	5	9			1	1			4	5			2	1			3	19
VI. Service workers			5	3	1	1			1	2			3	3			2	1			2	10
VII. Farm workers, farmer			2	1			1	1	1	1											*	3
VIII. Housewife					3	6	2	3	1	2			6	7			16	9	2	1	5	28
IX. Student	13	8	26	16	16	28	16	28	23	34	17	25	25	29	6	7	24	13	2	1	34	189
X. Not employed			2	1	1	2	1	1	2	3	1	1			1	1			2	1	2	10
25. Marital status																						
Single	14	9	39	24	16	29	18	31	15	22	17	26	17	20	8	9	18	10	2	1	32	181
Married	23	14	24	15	51	89	15	27	62	93	6	9	72	83	3	3	74	41	5	3	68	377
Parenthood status																						
Yes	16	13	13	8	38	66	10	18	43	64	3	5	44	50	2	2	47	26	2	1	45	253
No	6	10	11	31	27	52	11	40	34	51	20	30	46	53	9	10	45	25	5	3	55	305

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
Oldest child																						
(1-4)	2	1	2	1	3	5	2	3	3	5	1	1	4	4	1	1	2	1			9	22
(5-9)	2	1	2	1	6	11	2	4	4	6			3	3			2	1			11	27
(10-13)	2	1			6	10	2	3	11	16	1	2	10	11			5	3			19	46
(14-17)	3	2	2	1	10	18	2	3	9	14	1	1	9	10			5	3			21	52
(18-21)	3	2	5	3	5	9	2	3	4	6			4	5			14	8			15	36
(22-35)	5	3	3	2	8	14	1	2	7	11			10	12	1	1	14	8	2	1	22	54
(36-50)									4	6			1	1							3	7
Youngest child																						
(1-4)	2	1	3	2	8	14	3	6	9	13	1	1	6	7	1	1	2	1			19	46
(5-9)	3	2	3	2	14	24	3	5	14	21	1	1	8	9			4	2			27	66
(10-13)	6	4	3	2	7	12	1	2	7	11	1	1	9	10			9	5			19	47
(14-17)	2	1	2	1	6	10	2	3	3	5	1	1	4	5			9	5			13	31
(18-21)	2	1			2	3	1	2	4	6			7	8			7	4			10	24
(22-35)	2	1	2	1	2	4			3	5			6	7	1	1	13	7	2	1	11	27
(36-50)									2	3											1	3

TABLE 23 (continued)

N=Number of questionnaires Calender schedule--------- Dayhikers and backpackers- Percentage and frequency--	Sampling Periods: I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
26. Combined income of household?																						
Under $3,999	2	1	6	4			3	5			1	1									2	11
$4-6,999			8	5	2	3	1	1	2	3							2	1			2	13
$7-9,999			6	4	8	14	4	8	4	6	1	2	5	6	2	2	9	5	2	1	9	48
$10-14,999	8	5	6	4	18	31	3	6	17	25	2	3	24	27	1	1	24	13	4	2	21	117
$15,000+	13	8	8	5	24	42	8	15	32	48	3	4	36	41	2	2	34	19			33	184
High school (Single)	2	1	5	3	6	10	4	8	5	7	7	10	1	1	4	5	2	1			8	46
College student(Single)	10	6	18	11	6	11	7	12	7	11	9	13	15	17	2	2	14	8			16	91
College (Married)	3	2	5	3	4	7	2	3	10	15	1	2	10	11			7	4	2	1	9	48

TABLE 23 (continued)

N=Number of questionnaires	Sampling Periods																					
	I (N=62)				II (N=176)				III (N=150)				IV (N=115)				V (N=55)				TOTAL	
Calender schedule---------	A				B				C				D				E					
Dayhikers and backpackers-	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
Percentage and frequency--	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
27.What was the population of the town you lived in as a child?(Ages 6-18)																						
0-4,999	2	1	10	6	12	22	6	11	15	22	1	2	24	28	1	1	20	11	2	1	19	105
5-9,999	2	1	3	2	4	8	2	3	3	5	1	1	4	5			5	3			5	28
10-24,999	3	2	5	3	7	12	2	4	9	14	4	6	7	8	4	4	5	3	2	1	10	57
25-49,999	3	2	10	6	11	19	6	11	7	10	4	6	7	8	1	1	5	3			12	66
50-99,999	2	1	10	6	7	12	7	12	11	16	4	6	10	11	2	2	11	6			13	72
100-499,999	14	9	10	6	15	26	3	5	21	32	7	11	24	27	4	4	27	15	4	2	24	137
500,000+	11	7	16	10	11	19	7	12	11	16	2	3	14	16			18	10			17	93
28.What is the population of the town you now live in?																						
0-4,999	3	2	5	3	6	10	2	4	9	13	1	1	8	9			5	3			8	45
5-9,999			3	2	3	6	1	1	3	4	2	3	4	4	1	1					4	21
10-24,999	2	1	2	1	4	8	2	4	7	10	2	3	12	14	2	2	9	5	2	1	9	49
25-49,999			5	3	10	18	6	10	11	16	3	5	6	7	1	1	14	8			12	68
50-99,999			3	2	10	17	6	11	9	13	4	6	9	10	2	2	13	7			12	68
100-499,999	14	9	17	11	23	40	7	13	23	34	7	10	24	28	4	4	45	25	4	2	32	176
500,000+	18	11	27	17	11	19	9	15	17	25	5	7	27	31	2	2	5	3	2	1	23	131

TABLE 23 (continued)

N=Number of questionnaires	Sampling Periods																					
	I (N=62) A				II (N=176) B				III (N=150) C				IV (N=115) D				V (N=55) E				TOTAL	
Calender schedule---------																						
Dayhikers and backpackers-	DH=23		BP=39		DH=118		BP=58		DH=115		BP=35		DH=103		BP=12		DH=51		BP=4		DH+BP=558	
Percentage and frequency--	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Question and/or attribute:																						
Additional suggestions/ ideas/or comments:																						
Need better maps			3	2	1	1			3	5	3	4	2	2							10	14
Need more information			5	3	11	19	4	8	3	5	1	1	2	2							27	38
Trash assistance (bags)			2	1	1	1															1	2
Permit enforcement			3	2	1	1	3	6			1	1	1	1							8	11
Vegetative cutting prob					1	1	1	1	1	1											2	3
Litter enforcement			3	2	5	9	1	1	1	2	1	2	2	2	1	1					13	19
More vista cuts(scenic)											1	1									1	1
More shelters					1	1	2	4							2	2					5	7
Interpretation					2	3			1	1											3	4
Public relations problm					1	2	1	2	1	1											4	5
No restrictions	3	2			1	1	1	1													3	4
Shelter maintenance					1	1	1	2	1	2											4	5
Trail maintenance	2	1			3	5	3	6					3	3	1	1					11	16
Horse problem					3	5	1	2	2	3	1	1									8	11
Fees preferred			2	1			1	1													1	2

TABLE (continued)

NOTE: All frequencies and percentages are expressed as a total within each sampling period.

*Less than 1/2 of 1 percent.

**See route index for specific route

***Refer to Table 10, page 39.

APPENDIX F

MISCELLANEOUS TABLES

TABLE 24

OCCUPATIONAL CLASSIFICATION AND INDEX
CODE FOR GSMNP TRAIL RESPONDENTS

I. Professional, technical and kindred workers
   a. Draftsman - Engineering Aide
   b. Actor - Writer
   c. Executive
   d. Teacher (non-university) - Librarian - Personnel
   e. M.D. - D.D.S. - Nurse
   f. Lawyer - Judge
   g. Chemist - Scientist - Geologist - Metallurgist - Analyst
   h. Architect
   i. Engineer - Surveyor
   j. Forester
   k. University faculty

II. Managers, officials, proprietors (except farm)
   a. Small business man - Contractor
   b. Business manager
   c. Banker
   d. Real Estate - Insurance
   e. Newspaper publisher - Advertising

III. Clerical and sales workers (white collar)
   a. Clerk - Secretary
   b. Bookkeeper - Accountant - Cashier - Auditor - Statistician
   c. CPA - Salesman - Purchasing
   d. Clergy - Social worker
   e. Civil Service - TVA general

IV. Craftsmen, foremen, kindred workers
   a. Barber - Cook - Butcher - Tailor
   b. Carpenter - Electrician - Welder - Plumber - Mechanic - Brickmason - Painter
   c. Miscellaneous foremen and supervisors
   d. Craftsmen
   e. Printer - Inspector - Lab technician

V. Operatives and kindred workers, laborers
   a. Laborer - Construction worker - Factory worker - Railroad worker
   b. Truck driver - Dozer operator - Bus driver

VI. Service workers (including private)
   a. Law enforcement - Postman - Fireman - Service station
   b. Serviceman (armed forces)

TABLE 24 (continued)

VII.	Farm workers - Farmer
VIII.	Housewife
IX.	Student(s)
X.	Not employed a. Retired b. Disabled c. Unemployed

TABLE 25

USE RATES FOR THREE HOUR SAMPLING PERIODS BY TRAIL LOCATIONS AND SAMPLING PERIOD

Day of week	Sampling Locations: Abrams Falls	Alum Cave	Cosby	Deep Creek	W. of Clingmans Dome	Elkmont	E. of Newfound Gap	Gregory	Rainbow Falls	Smokemont	Anthony Ridge	Total Number of Sampling Periods
I. (April 1 through May 27, 1972--Pre-testing and revision of the questionnaire)												
Sat.		110(1)*			86(1)		30(5)		47(1)		12(1)	(9)
II. (June 7 through July 26, 1972)												
Mon.	112(1)						70(1)		24(1)		3(1)	(4)
Tues.	291(1)	172(1)	3(1)	3(1)		7(1)						(5)
Wed.			3(1)		26(2)			3(1)	56(1)			(6)
Thurs.							39(1)	0(1)			36(1)	(3)
Fri.	3(1)			0(1)	80(1)	12(2)			53(1)	14(3)	34(1)	(12)
Sat.	172(1)	112(2)		0(2)	9(1)		80(2)		35(1)			(7)
Sun	149(1)		16(2)			1(1)		20(2)		3(1)		(6)
Mean	145(5)	95(3)	10(4)	0.8(4)	35(4)				42(4)	11(4)	24(3)	(43)
III. (July 27 through September 14, 1972)												
Mon.		76(1)				0(1)			70(2)			(4)
Tues.		165(1)		0(1)	31(2)							(4)
Wed.			7(1)	0(1)		0(1)		3(1)		0(1)	14(1)	(6)
Thurs.	235(1)		9(1)								71(1)	(3)
Fri.	68(2)				15(1)	0(2)	22(3)	0(1)		0(2)	26(2)	(12)
Sat.		30(1)	0(1)	0(1)	41(1)		23(2)	2(1)				(8)
Sun.	27(1)	0(1)	0(1)					0(1)	30(2)	2(1)		(7)
Mean	100(4)	68(4)	4(4)	0(3)	30(4)	0(4)	22(5)	1(4)	50(4)	.5(4)	34(4)	(44)

TABLE 25 (continued)

Day of week	Sampling Locations: Abrams Falls	Alum Cave	Cosby	Deep Creek	W. of Clingmans Dome	Elkmont	E. of Newfound Gap	Gregory	Rainbow Falls	Smokemont	Anthony Ridge	Total Number of Sampling Periods
IV. (August 16 through September 12, 1972--Supplementary data)												
Mon.		26(1)										(1)
Tues.		73(2)										(2)
Wed.		75(2)					66(1)					(3)
Thurs.	54(3)											(3)
Fri.		14(1)										(1)
Mean	54(3)	56(6)					66(1)					(10)
V. (October 14 through November 7, 1972)												
Tues.	0(1)	41(1)			0(1)	0(1)	26(1)	0(1)	14(1)		0(1)	(8)
Sat.	93(1)	65(1)			8(1)			10(1)	59(1)			(5)
Sun.						4(1)	10(1)				24(1)	(3)
Mean	93(2)	53(2)			4(2)	2(2)	18(2)	5(2)	37(2)		12(2)	(16)

*Parenthesis indicates number of three-hour sampling periods.

TABLE 26

MEANS FOR CERTAIN VARIABLES BY SAMPLING PERIODS AND FOR DAYHIKERS

Dayhikers (410)	I(23)	II(118)	III(115)	IV(103)	V(51)	Mean(410)
1. Number in the group	3.26	3.78	3.34	2.59	2.74	3.14
2. Age of respondent	32.56	33.77	34.09	32.87	33.80	33.42
3. Ages of all in the group	26.10	26.40	26.60	27.20	31.00	27.46
4. Oldest in the group	35.65	36.20	36.60	34.00	35.16	35.52
5. Youngest in the group	23.04	19.58	19.40	22.97	26.65	22.33
6. Longest days ever backpacked	3.30	1.51	2.04	1.65	1.39	1.98
7. Oldest child of respondent	17.20	8.70	9.65	7.48	9.20	10.45
8. Youngest child of respondent	12.40	5.55	6.83	5.93	8.16	7.77
9. Number of children of respondent	1.09	1.56	1.46	1.09	1.04	1.25

TABLE 27

MEANS FOR CERTAIN VARIABLES BY SAMPLING PERIODS AND FOR BACKPACKERS

Backpackers(148)	I(39)	II(58)	III(35)	IV(12)	V(4)	Mean(148)
1. Number in the group	3.15	3.78	3.83	4.08	4.25	3.82
2. Age of respondent	25.18	26.09	23.94	25.92	32.25	26.68
3. Ages of all in the group	23.80	21.10	19.30	24.70	36.40	25.06
4. Oldest in the group	26.03	27.84	25.06	30.08	32.75	28.35
5. Youngest in the group	20.38	18.40	18.89	24.08	28.75	22.10
6. Length of stay or trip	3.28	5.21	5.43	4.50	4.25	4.53
7. Longest days ever backpacked	6.60	6.69	7.00	10.08	8.75	7.82
8. Oldest child of respondent	3.49	4.21	1.26	3.25	7.50	3.94
9. Youngest child of respondent	2.28	2.86	1.06	2.83	7.00	3.21
10. Number of children of respondent	0.62	0.62	0.23	0.33	0.50	0.46

VITA

The author, Gary G. Marsh, was born in Knoxville, Tennessee, on September 10, 1948. He attended elementary school in that city and graduated from Knoxville Central High School in 1966. The following September he entered Carson-Newman College in the pre-forestry curriculum. In March, 1969 he transferred to the Department of Forestry at The University of Tennessee. In June, 1971, he received the Bachelor of Science degree, with a major in Forestry.

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He is married to the former Joleen Lipford of Triangle, Virginia.